

# PROJECT MANUAL



Kingsessing Recreation Center  
Building and Site Improvements

4901 Kingsessing Ave.

PROJECT No. 16368E-02-03

CITY OF PHILADELPHIA

REBUILD/PHILADELPHIA PARKS AND RECREATION

**Project Specifications- VOL. 1**

**08/28/2023**

**Bid Package #2**

**Issue for Bid**

NOT FOR CONSTRUCTION



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A511-R.2	ENLARGED PLAN, ELEV., DTLS - KITCHEN	BP#2 8/28/2023
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A801-R.2	FINISH PLAN - LOWER LEVEL	BP#2 8/28/2023
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A804-R.2	MATERIAL SCHEDULE	BP#2 8/28/2023
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A901-R.2	DOOR AND PARTITION SCHEDULES	BP#2 8/28/2023
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M200-R.2	MECHANICAL PROPOSED DUCTWORK - LOWER LEVEL BASE SCOPE	BP#2 8/28/2023
M200B-R.2	MECHANICAL PROPOSED DUCTWORK - LOWER LEVEL DEDUCT ALTERNATE	BP#2 8/28/2023
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M203-R.2	MECHANICAL PROPOSED DUCTWORK - ATTIC/ROOF	BP#2 8/28/2023
M300-R.2	MECHANICAL PROPOSED PIPING - LOWER LEVEL BASE SCOPE	BP#2 8/28/2023
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M301-R.2	MECHANICAL PROPOSED PIPING - FIRST FLOOR	BP#2 8/28/2023
M302-R.2	MECHANICAL PROPOSED PIPING - SECOND FLOOR	BP#2 8/28/2023
M303-R.2	MECHANICAL PROPOSED PIPING - ATTIC/ROOF	BP#2 8/28/2023
M400-R.2	MECHANICAL PARTIAL PLANS & SECTIONS	BP#2 8/28/2023
M500-R.2	MECHANICAL CONTROLS SEQUENCES	BP#2 8/28/2023
M501-R.2	MECHANICAL DIAGRAMS	BP#2 8/28/2023
M600-R.2	MECHANICAL SCHEDULES	BP#2 8/28/2023
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M700-R.2	MECHANICAL DETAILS	BP#2 8/28/2023
M701-R.2	MECHANICAL DETAILS	BP#2 8/28/2023
M702-R.2	MECHANICAL DETAILS	BP#2 8/28/2023

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E200-R.2	ELECTRICAL PROPOSED POWER - LOWER LEVEL BASE SCOPE	BP#2 8/28/2023
E200B-R.2	ELECTRICAL PROPOSED POWER - LOWER LEVEL DEDUCT ALTERNATE	BP#2 8/28/2023
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E201-R.2	ELECTRICAL PROPOSED POWER - FIRST FLOOR	BP#2 8/28/2023
E202-R.2	ELECTRICAL PROPOSED POWER - SECOND FLOOR	BP#2 8/28/2023
E203-R.2	ELECTRICAL PROPOSED POWER - ATTIC/ROOF	BP#2 8/28/2023
E204-R.2	ELECTRICAL PROPOSED POWER - SITE PLAN	BP#2 8/28/2023
E205-R.2	ELECTRICAL PROPOSAL POWER - SITE PLAN	BP#2 8/28/2023

E300-R.2	ELECTRICAL PROPOSED LIGHTING - LOWER LEVEL BASE SCOPE	BP#2 8/28/2023
E300B-R.2	ELECTRICAL PROPOSED LIGHTING - LOWER LEVEL DEDUCT ALTERNATE	BP#2 8/28/2023
E300C-R.2	ELECTRICAL PROPOSED LIGHTING - LOWER LEVEL ADD ALTERNATE	BP#2 8/28/2023
E301-R.2	ELECTRICAL PROPOSED LIGHTING - FIRST FLOOR	BP#2 8/28/2023
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E303-R.2	ELECTRICAL PROPOSED LIGHTING - ATTIC	BP#2 8/28/2023
E400-R.2	ELECTRICAL SINGLE-LINE DIAGRAM - EXISTING	BP#2 8/28/2023
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E501-R.2	ELECTRICAL SCHEDULES	BP#2 8/28/2023
E502-R.2	ELECTRICAL SCHEDULES	BP#2 8/28/2023
E503-R.2	ELECTRICAL SCHEDULES	BP#2 8/28/2023
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P100B-R.2	PLUMBING DEMOLITION - LOWER LEVEL DEDUCT ALTERNATE	BP#2 8/28/2023
P101-R.2	PLUMBING DEMOLITION - FIRST FLOOR	BP#2 8/28/2023
P102-R.2	PLUMBING DEMOLITION - SECOND FLOOR	BP#2 8/28/2023
P103-R.2	PLUMBING DEMOLITION - ATTIC	BP#2 8/28/2023
P200-R.2	PLUMBING PROPOSED DRAINAGE - LOWER LEVEL BASE SCOPE	BP#2 8/28/2023
P200B-R.2	PLUMBING PROPOSED DRAINAGE - LOWER LEVEL DEDUCT ALTERNATE	BP#2 8/28/2023
P200C-R.2	PLUMBING PROPOSED DRAINAGE - LOWER LEVEL ADD ALTERNATE	BP#2 8/28/2023
P201-R.2	PLUMBING PROPOSED DRAINAGE - FIRST FLOOR	BP#2 8/28/2023
P202-R.2	PLUMBING PROPOSED DRAINAGE - SECOND FLOOR	BP#2 8/28/2023
P203-R.2	PLUMBING PROPOSED DRAINAGE - ROOF	BP#2 8/28/2023
P300-R.2	PLUMBING PROPOSED SUPPLY - LOWER LEVEL BASE SCOPE	BP#2 8/28/2023
P300B-R.2	PLUMBING PROPOSED SUPPLY - LOWER LEVEL DEDUCT ALTERNATE	BP#2 8/28/2023
P300C-R.2	PLUMBING PROPOSED SUPPLY - LOWER LEVEL ADD ALTERNATE	BP#2 8/28/2023
P301-R.2	PLUMBING PROPOSED SUPPLY - FIRST FLOOR	BP#2 8/28/2023
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P400-R.2	PLUMBING SANITARY RISER BASE SCOPE	BP#2 8/28/2023
P400B-R.2	PLUMBING SANITARY RISER DEDUCT ALTERNATE	BP#2 8/28/2023
P400C-R.2	PLUMBING SANITARY RISER ADD ALTERNATE	BP#2 8/28/2023
P401-R.2	PLUMBING SUPPLY RISER BASE SCOPE	BP#2 8/28/2023
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P401C-R.2	PLUMBING SUPPLY RISER ADD ALTERNATE	BP#2 8/28/2023
P500-R.2	PLUMBING SCHEDULES	BP#2 8/28/2023
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FA001-R.2	FIRE ALARM INDEX SHEET	BP#2 8/28/2023
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FA101-R.2	FIRE ALARM DEMOLITION - FIRST FLOOR	BP#2 8/28/2023

FA102-R.2	FIRE ALARM DEMOLITION - SECOND FLOOR	BP#2 8/28/2023
FA200-R.2	FIRE ALARM PROPOSED - LOWER LEVEL BASE SCOPE	BP#2 8/28/2023
FA200B-R.2	FIRE ALARM PROPOSED - LOWER LEVEL - DEDUCT ALTERNATE	BP#2 8/28/2023
FA200C-R.2	FIRE ALARM PROPOSED - LOWER LEVEL - ADD ALTERNATE	BP#2 8/28/2023
FA201-R.2	FIRE ALARM PROPOSED - FIRST FLOOR	BP#2 8/28/2023
FA202-R.2	FIRE ALARM PROPOSED - SECOND FLOOR	BP#2 8/28/2023
FA203-R.2	FIRE ALARM PROPOSED - ATTIC	BP#2 8/28/2023
FA300-R.2	FIRE ALARM RISER & MATRIX	BP#2 8/28/2023

#### FIRE PROTECTION

FP001-R.2	FIRE PROTECTION INDEX SHEET	BP#2 8/28/2023
FP100-R.2	FIRE PROTECTION PROPOSED - LOWER LEVEL	BP#2 8/28/2023
FP101-R.2	FIRE PROTECTION PROPOSED - FIRST FLOOR	BP#2 8/28/2023
FP102-R.2	FIRE PROTECTION PROPOSED - SECOND FLOOR	BP#2 8/28/2023
FP103-R.2	FIRE PROTECTION PROPOSED - ATTIC	BP#2 8/28/2023

#### TELECOM

T-001-R	TELECOM GENERAL NOTES, ABBREVIATIONS & SYMBOLS	BP#2 8/28/2023
TD-100-R	TELECOM DEMOLITION - BASEMENT	BP#2 8/28/2023
TD-101-R	TELECOM DEMOLITION - FIRST FLOOR	BP#2 8/28/2023
TD-102-R	TELECOM DEMOLITION - SECOND FLOOR	BP#2 8/28/2023
TD-103-R	TELECOM DEMOLITION - SITE	BP#2 8/28/2023
T-100-R.2	TELECOM PROPOSED- LOWER LEVEL	BP#2 8/28/2023
T-101-R	TELECOM PROPOSED- FIRST FLOOR	BP#2 8/28/2023
T-102-R	TELECOM PROPOSED- SECOND FLOOR	BP#2 8/28/2023
T-103-R	TELECOM PROPOSED- ATTIC	BP#2 8/28/2023
T-104-R	TELECOM PROPOSED- SITE	BP#2 8/28/2023
T-301-R	TELECOM - ENLARGED PLANS	BP#2 8/28/2023
T-401-R	TELECOM - DETAILS	BP#2 8/28/2023
T-402-R	TELECOM - DETAILS	BP#2 8/28/2023
T-403-R	TELECOM - DETAILS	BP#2 8/28/2023
T-501-R	TELECOM - DIAGRAMS AND SCHEDULES	BP#2 8/28/2023

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SECTION 002113

INSTRUCTIONS TO BIDDERS

PART 1: GENERAL

1.1 BASIC INFORMATION

- A. The following is a list of basic bidding information for the convenience of Bidders. If discrepancies between information contained in this section and other Bidding Documents are uncovered, the requirements of the other Bidding Documents shall govern.
1. Project Title: Kingsessing Recreation Center Building and Site Improvement
  2. Project Location: *Kingsessing Library*  
*4901 Kingsessing Avenue,, Philadelphia, PA 19143*
  4. Allowances are included.
  5. Alternates are included.
  6. Unit Prices are not included.
  7. Proposals shall be valid for 60 calendar days after the closing of the quote unless otherwise mutually extended by the PRA and apparent selected Bidder.
  8. Access to the site for inspection by the Bidders will be part of the pre-bid conference scheduled on the cover.
  9. I will substantially complete the Work, ready for final payment, in accordance with the Contract Documents within 550 consecutive calendar days counting from the date stated in the Notice to Proceed.

1.2 INVOLVED PARTIES:

- A. City: City of Philadelphia, PA.
- B. Department: Parks & Recreation,  
City of Philadelphia, 11<sup>th</sup> floor,  
One Parkway, 1515 Arch Street,  
Philadelphia, PA
- C. Department: Rebuild,  
City of Philadelphia, Mezzanine  
One Parkway, 1515 Arch Street,  
Philadelphia, PA  
Executive Director: Kira Strong
- D. Commissioner, Parks & Recreation: Acting Commissioner, Orlando Rendon
- E. Deputy Commissioner, Parks & Recreation: Aparna Palantino
- F. Rebuild Project Manager: Name: Kevin A'Hearn  
Phone: (267) 408-9106  
Yolanda Perez Reed  
Phone: (610) 425-9724



H. Contracting Agency: Philadelphia Redevelopment Authority  
Robert LaBrum, Phone: 215-209-8763

I. Consulting Firm: *Kelly Maiello Architects*  
*1420 Walnut Street, 15<sup>th</sup> Flr*  
*Philadelphia, PA 19102*  
*Phone: (215) 546-0800 x115*  
*Point of contact: Dori Bova AIA*

### 1.3 DEFINITIONS

A. Refer to Section 007200, "Standard Contract Requirements".

### 1.4. SUBSTITUTIONS

A. Requests for substitutions shall comply with Section 012500, "Substitution Procedures."

### 1.5 AMENDMENTS

- A. Amendments will be posted on [www.philadelphiaredevelopmentauthority.org](http://www.philadelphiaredevelopmentauthority.org) to all known to have been added to the Bid list.
- B. Each Bidder shall ascertain prior to submitting Quote that Bidder has received all Amendments issued and shall acknowledge their receipt in their Quote.
- C. Bidder must Acknowledge Amendments.

### 1.9 BIDDING PROCEDURES

- A. Form and Style of Proposals, See Section 007200 Standard Contract Requirements, Section 7.
  - 1. Submit Proposals on forms provided in the quote package.
  - 2. Bidders may withdraw and resubmit Proposals for errors or corrections up until the closing of the bid.
  - 3. All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."
  - 4. Proposals shall not contain any conditions or qualifications whatsoever.
  - 5. Proposals shall include an allowance for permits and licenses in connection with all or any portion of the work.
  - 6. All coordination needed to procure and obtain the required permits and licenses necessary to perform the work in its entirety shall be the responsibility of the Bidder/Contractor. Payment under this allowance shall be for the actual permit or license fee(s). Additional costs to procure such permits or licenses will not be reimbursed to the Bidder/Contractor. Refer to section 007200 Standard Contract Requirements, Clause 34.
- B. Bid Security, See Section 007200 Standard Contract Requirements, Section 10.
  - 1. Each Quote shall be accompanied by bid bond as per the requirements of the Standard Contract Requirements for Public Works Contracts.
  - 2. Bid Bond shall be issued on form included in the attachments tab.
- C. Submission of Proposals  
Proposals will only be accepted in either of the following:

1. Online Submission – via the electronic portal on PRA's website (<http://www.philadelphiaredevelopmentauthority.org/>); or
2. Hard Copy Submission – Submit 3 original copies of the Response and one electronic copy on a USB Flash Drive to the PRA via hand delivery or registered mail. Files on the USB Flash Drive may only be in Microsoft Word or Adobe PDF. Applicants may hand deliver or send their Response via registered mail to:

Robert LaBrum, Director, Design & Construction  
Philadelphia Redevelopment Authority  
1234 Market Street, 16th Floor  
Philadelphia, PA 19107

- D. Modification or Withdrawal of Quote
1. A Quote may not be modified, withdrawn or canceled by the Bidder after the time and date designated for the receipt of Proposals except as provided in the Standard Contract Requirements for Public Works Contracts.
  2. Prior to the time and date designated for receipt of Proposals, any Quote submitted may be withdrawn.
  3. Withdrawn Proposals can be reopened and resubmitted.
- 1.10 PERFORMANCE BONDS
- A. Bond Requirements: Bidder shall furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder per the requirements of the Standard Contract Requirements and other requirements of the Bidding Documents.
  - B. Bidder shall provide and furnish bonds to the contract limit which includes contingency.
- 1.11 INSURANCE CERTIFICATES
- A. The successful Bidder will not be permitted to start any Work under the Contract until certificates covering all insurance requirements are submitted per the Standard Contract Requirements and other requirements of the Bidding Documents.
- 1.14 PRE-BID INFORMATION
- A. Pre-bid information regarding the Project is correct and current at the time it is posted, and is offered to obtain Proposals.
  - B. The pre-bid information cannot be guaranteed to remain correct in every detail throughout the time preceding the signing of the Contract due to such variables as changes in budget, labor and material markets and anticipated date of issuing the notice to proceed.
- 1.15 INFORMATION AVAILABLE TO BIDDERS
- A. Site Visit
    1. Bidders shall make themselves familiar with all readily observable features of the Project Site. Readily observable features include spaces above lay-in ceilings, behind access panels and other similar areas not normally exposed to view but easily accessible.

2. Bidder shall not rely solely on Contract Drawings or Record Drawings.
3. Uncovered conditions differing substantially from those indicated on Record Drawings and not observable during the pre-bid visit will be considered for modification to the Contract.

-

END –

## SECTION 00 2114

### DIESEL ENGINE EMISSIONS CONTROLS

Contractor, by submission of its bid, agrees to meet the requirements of this Section.

- A. Covered Vehicles: Vehicles covered under this Section include any nonroad diesel engine that has a horsepower greater than 50.
- B. Requirements
1. all contractors, and all of the contractor's subcontractors, if any, in the performance of this contract use ultra-low sulfur diesel fuel, and a listed clean diesel technology for reducing the emission of pollutants for diesel-powered non-road engines. Clean diesel technologies are further defined in part D of this Section. Retrofit emission control devices shall consist of diesel oxidation catalysts ("DOC") or such other technologies that provide a minimum emissions reduction of twenty percent (20%) of particulate matter with a mean aerodynamic width of less than ten (10) microns (PM10) in the application for which it is verified. Any retrofit emission control device installed to comply with this Section must either be listed by EPA or the California Air Resources Board (CARB) as a verified diesel retrofit technology that reduces particulate matter emissions by 20% or more, or must be certified by the diesel retrofit device manufacturer as a product that reduces particulate matter emissions by 20% or more for the covered vehicle.
  2. No later than two business days before any covered vehicle is brought onto the contract site, the successful bidder (hereinafter, "contractor") shall submit to the City's project manager information about the vehicle including confirmation that the appropriate emissions control technology has been installed on the vehicle or that the vehicle is Tier 4 or Tier 4 Interim. Except as otherwise provided, any vehicle covered under this Section shall be in compliance with this Section prior to being brought onto the contract site.
    - a. Contractor shall submit the following information for each covered vehicle (using *Fleet Roster for Public Works Construction Projects* form):
      - i. vehicle identification number (VIN), if applicable, or vehicle serial number, and the vehicle type, make, year and owner;
      - ii. the horsepower rating of each engine;
      - iii. the emission control device manufacturer name, model, and verifying/certifying organization; and
      - iv. the type of fuel to be used and approximate expected quantity.
    - b. In the event contractor has purchased appropriate emissions control technology, but the technology is not delivered before use of the covered vehicle is required on the contract site, the contractor shall, in addition to submission of a.i., through iv. above, submit proof of purchase of the emissions control technology. Installation of the appropriate emissions control technology must be completed within five (5) days of delivery of the technology. In no event may Contractor use the covered vehicle without the use of the emission control technology, for which the technology has already been purchased and identified, on the contract site for longer than sixty (60) days.
    - c. If a covered vehicle owned by a contractor breaks down on the contract site, contractor may use, if a compliant replacement is unavailable, a temporary vehicle that is not compliant while the covered vehicle is being repaired; the temporary vehicle cannot remain on site for more than 30 cumulative days after the date of the initial breakdown of the covered vehicle. Contractor shall notify the project manager in writing prior to bringing a non-compliant vehicle on the contract site.
  3. The contractor shall establish truck-staging zones for vehicles that are waiting to load or unload material at the contract site. Such zones shall be located where the emissions from the trucks will

## SECTION 00 2114

### DIESEL ENGINE EMISSIONS CONTROLS

have minimum impact to the public.

4. The contractor shall not permit idling of delivery and/or dump trucks, or equipment on the contract site during periods of non-active use, and it should be limited to three (3) minutes in accordance with the Philadelphia Traffic Code Anti-Idling Ordinance Section 12-1127(1) of The Philadelphia Code ([http://www.phila.gov/philacode/html/\\_data/title12/chapter\\_12\\_1100\\_miscellaneous\\_/12\\_1127\\_excessive\\_idling\\_of\\_an.html](http://www.phila.gov/philacode/html/_data/title12/chapter_12_1100_miscellaneous_/12_1127_excessive_idling_of_an.html)) and the Pennsylvania Diesel-Powered Motor Vehicle Idling Act, Title 35 Purdon's Pennsylvania Statutes, Section 4601 et seq.

#### C. Exemptions

1. Subject to written approval by the City of Philadelphia Air Management Services (AMS), covered vehicles will be exempted from low diesel emission controls if one or more of the following conditions exist:
  - a. it is physically impossible to install appropriate emissions control technology on the vehicle;
  - b. installation of the appropriate emissions control technology would render vehicle operation unsafe due to obstructed sightline;
  - c. installation of the appropriate emissions control technology would void any applicable expressed manufacturer's warranty on the vehicle; or
  - d. the covered vehicle will not be at the work site for more than a total of three (3) business days.
2. In support of a request for exemption, contractors shall provide to AMS one of the following:
  - a. a signed letter from one or more diesel technology vendors, written on the vendor's formal stationery, certifying that no emissions controls that would reduce Particulate Matter (PM) emissions by at least 20% and allow for safe operation could be physically installed, or the cost of installing such control technology would cost 150% more than the purchase price of the clean diesel technology device;
  - b. a signed letter from the vehicle manufacturer certifying that the installation of any device to reduce PM emissions by 20% or more would void the applicable expressed manufacturer's warranty, along with a copy of the warranty for each vehicle for which an exemption is sought; or
  - c. a signed letter on the contractor's company letterhead stating that the covered vehicle will remain on site for no longer than three (3) days total during the duration of the project.
3. In no event will the City grant an exemption from the required use of ultra-low sulfur diesel fuel or the idling laws.

#### D. Definitions

1. Contract site – all areas covered under the contract, and areas accessed for purposes of performing activity under the contract;
2. Non-active use – a period of time greater than five (5) minutes when a piece of diesel equipment is not being operated in performance of its work;

## SECTION 00 2114

### DIESEL ENGINE EMISSIONS CONTROLS

3. Non-road – diesel vehicles listed by EPA for use in non-road applications. These include construction, agricultural, and other industrial vehicles that are not legally operable on highways;
4. On-road – vehicles listed by EPA for on-highway applications;
5. Truck-staging zone – a designated area on the contract site where delivery or pickup activities will be located;
6. Ultra low sulfur diesel fuel – Diesel fuel with a sulfur content of 15 parts per million or less;
7. Vehicle – a piece of diesel-powered equipment being used for contract activities; and
8. Listed clean diesel technology – includes:
  - a. *Diesel oxidation catalyst – a device similar to a catalytic converter that reduces diesel emissions and does not require regeneration;*
  - b. *Tier 4 or Tier 4 Interim – any vehicle certified by EPA as meeting Tier 4 emissions standards or Tier 4 Interim emissions standards;*
  - c. *Particulate filter – a device that traps soot produced by the engine and vaporizes this soot through the application of heat, requiring only periodic maintenance;*
  - d. *Closed crankcase ventilation – a device that reduces fugitive emissions from the vehicle's crankcase by routing them through the tailpipe;*
  - e. *Selective catalytic reduction – A device that reduces emissions of oxides of nitrogen by treating exhaust with urea;*
  - f. *Emissions upgrade groups – groups of replacement components that, when installed during vehicle overhaul, reduce engine emissions;*
  - g. *Engine repower – the replacement of a vehicle's engine with a newer model to reduce tailpipe emissions; and*
  - h. *Any other technology verified by EPA or CARB to reduce diesel particulate emissions by 20% or more.*

#### E. Monitoring and Penalties for Non-Compliance

1. City reserves the right to request purchase and/or installation documents to verify contractor's, and any subcontractor's installation of the retrofit in the vehicle. These purchase documents shall be provided to the City's project manager by the contractor within five (5) days of the City's request.
2. Any false certification or representation in connection with these requirements for Diesel Engine Emissions Controls and/or any failure to comply with these requirements shall constitute a material breach of contract entitling the City to all rights and remedies provided in the contract and otherwise available at law and/or in equity, including but not limited to the monetary assessment set forth herein. For contracts of \$500,000.00 or less, an assessment of \$500.00 per offense per day shall be imposed upon the contractor for every covered vehicle operating in violation of this section. For all other contracts, an assessment of \$1000.00 per offense per day shall be imposed upon the contractor for every covered vehicle operating in violation of this section. In addition, it is understood that false certification or representation is subject to penalties under Title 18 Pa. C.S.A. § 4904 (relating to unsworn falsification to authorities).

# NOTICE TO SELLERS-MAYOR'S EXECUTIVE ORDER 7-14

## NOTICE TO SELLERS

Pursuant to the Order, available on-line at

<http://www.phila.gov/ExecutiveOrders/Executive%20Orders/EO%207-14.pdf>, Contractor agrees that Contractor and all of its Subcontractors, at any tier, shall report to the OIG knowledge of violations subject to investigation by the OIG pursuant to the Order; shall cooperate fully with representatives of the OIG by providing complete and accurate information as well as necessary assistance in matters under investigation; shall keep conversations and contact with the OIG confidential, except and to the extent the OIG may authorize disclosure; and shall instruct their employees that under no circumstances shall any person take or threaten any action in an attempt to prevent anyone from providing information to a City official regarding conduct that may be investigated by the OIG, or from cooperating with the OIG, or retaliate against anyone for doing so or against anyone who is about to do so.

All entities and individuals affected by Mayor's Executive Order 7-14 are advised to thoroughly read the Order, especially Section 3, **Type of Matters Investigated by the OIG**, Section 4, **Entities Subject to Investigation by the OIG**, Section 8, **Duties of Executive Agencies and Other Entities**, Section 9, **Responsibilities of Officers and Employees of Executive Agencies and Other Entities**, and Section 10, **Responsibilities of City Contractors, Recipients of City Assistance and Recipients of City Funding**.

**PHILADELPHIA REDEVELOPMENT AUTHORITY**

**KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS  
1201 S 51ST ST  
PHILADELPHIA, PA 19143**

**THIS BID FORM IS COMPLETE AND MUST NOT BE SEPARATED. IF ANY SHEET OR SHEETS ARE DETACHED WHEN SUBMITTED AS A BID, THE PHILADELPHIA REDEVELOPMENT AUTHORITY RESERVES THE RIGHT TO REJECT YOUR BID.**

\_\_\_\_\_  
**FIRM NAME**

\_\_\_\_\_  
**FIRM ADDRESS**

\_\_\_\_\_  
**FEDERAL EIN**

\_\_\_\_\_  
**TOTAL BASE BID**

\_\_\_\_\_  
**PHILADELPHIA BUSINESS TAX ID**



To the Philadelphia Redevelopment Authority:

I, the undersigned Bidder, hereby propose to furnish all the labor, materials and equipment, perform the whole of the work, and submit to all conditions, as represented, intended and implied, both particularly and generally, by the Plans, Special Specifications, Standard Specifications, Standard Details, Standard Contract Requirements, Form of Agreement, the Ordinance authorizing the work and this bid at the prices herein stated, and agrees that each item bid shall be complete in itself, and the Philadelphia Redevelopment Authority may increase or diminish the amount of work thereunder, or omit the item without invalidating the unit price bid for it or any other item, on the following terms to wit:

**BID AMOUNT**

We will complete the Work in accordance with the Contract Documents for the following Bid Amount as defined in Section 00700, Standard Contract Requirements. (Insert Bid Amount in words as well as figures.)

Div 01	General Conditions	\$
Div 02	Interior Demolition	\$
Div 02	Site Demolition	\$
Div 03	Concrete	\$
Div 04	Masonry	\$
Div 05	Metals	\$
Div 05	Metals – Structural Steel (Material Only)	\$
Div 05	Metals – Cold Formed Metal Framing (Material Only)	\$
Div 05	Metals – Exterior Stairs (Materials Only)	\$
Div 05	Metals – Ext. Mechanical Enclosures	\$
Div 06	Wood, Plastics, and Composites	\$
Div 07	Thermal and Moisture Protection	\$
Div 08	Openings	\$
Div 08	Openings – Doors/Frames/Hardware (Material Only)	\$
Div 08	Openings – Window Security Screens (Material Only)	\$
Div 08	Openings – Glazing (Material Only)	\$
Div 08	Openings – Louvers (Material Only)	\$
Div 09	Finishes – Plastering (Gyp + Cement)	\$
Div 09	Finishes – Tiling	\$
Div 09	Finishes – Resinous Flooring	\$
Div 09	Finishes – Resilient Flooring	\$
Div 09	Finishes – Resilient Athletic Flooring	\$
Div 09	Finishes – Paints & Coatings	\$

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

004114-2

CONSTRUCTION BID PROPOSAL

Div 10	Specialties – Interior/Exterior Signage	\$
Div 10	Specialties – Toilet Compartments/Accessories	\$
Div 10	Specialties – Fire Extinguishers/Cabinets	\$
Div 10	Specialties – Wall Mounted Standards/Closet + Utility Shelving	\$
Div 10	Specialties – Wire Mesh Partitions/Ext. Enclosures	\$
Div 11	Equipment	\$
Div 11	Equipment – Play Equipment + Structures	\$
Div 12	Furnishings	\$
Div 13	Special Construction - Fabricated Structures	\$
Div 14	Hydraulic Elevator & Wheelchair Lift	\$
Div 14	Conveying Equipment – Elevator (Material Only)	\$
Div 14	Conveying Equipment – Wheelchair Lifts (Material Only)	\$
Div 21	Fire Protection – Sprinkler System	\$
Div 22	Plumbing	\$
Div 22	Plumbing – Equipment (Material Only)	\$
Div 22	Plumbing – Fixtures (Material Only)	\$
Div 23	HVAC	\$
Div 23	HVAC – Ductwork	\$
Div 23	HVAC – Equipment AHU’s, Condensing Units, (Material Only)	\$
Div 26	Electrical	\$
Div 26	Electrical – Light Fixtures (Material Only)	\$
Div 26	Electrical – Switchgear (Material Only)	\$
Div 27	Telecom	\$
Div 28	Electronic Security Systems - Video Surveillance	\$
Div 28	Electronic Security Systems - Fire Alarms	\$
Div 31	Earthwork	\$
Div 32	Exterior Improvements – Asphalt Paving	\$
Div 32	Exterior Improvements – Concrete Paving	\$
Div 32	Exterior Improvements – Protective Playground Surfacing	\$
Div 32	Exterior Improvements – Site Furnishings	\$
Div 32	Exterior Improvements – Synthetic Turf	\$
Div 32	Exterior Improvements – Gazebo	\$
Div 32	Exterior Improvements – Soil Prep/Turfs & Grass	\$
Div 33	Site Utilities	\$

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

004114-3

CONSTRUCTION BID PROPOSAL

TOTAL BASE BID AMOUNT \$ \_\_\_\_\_

(in words) \_\_\_\_\_  
DOLLARS

1. ALLOWANCE No. 1: Bidders are to include the amount equal to Two Percent (2%) of their base bid amount for payment of Permit and License fees to all regulatory agencies. Refer to Allowances, Section 01210 for more details. ALLOWANCE AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_
2. ALLOWANCE No. 2: Bidders are to include the amount of \$30,000.00 to their base bid amount for new site signage. Refer to Allowances, Section 012100 for more details. THIRTY THOUSAND DOLLARS, \$30,000.00.
3. ALLOWANCE No. 3: Bidders are to include the amount of \$50,000.00 to their base bid amount for site security. Refer to Allowances, Section 012100 for more details. ALLOWANCE AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_
4. ALLOWANCE No. 4: Bidders are to include the amount of \$25,000.00 to the base bid amount for Moving and Storage. Refer to Allowances, Section 012100 for more details. TWENTY-FIVE THOUSAND DOLLARS, \$25,000.00.
5. ALLOWANCE No. 5: Bidders are to include the amount of \$ TBD to the base bid amount for unforeseen coordination issues that may arise between Package 1 contract and Package 2 contract. Refer to Allowances, Section 012100 for more details.  
\_\_\_\_\_.

**TOTAL BASE BID PLUS ALLOWANCES.**\$ \_\_\_\_\_

(in words) \_\_\_\_\_ DOLLARS

**SCHEDULE OF ALTERNATES** (please refer to spec section 012300 UNIT PRICES for description)

- A. Alternate No. R1: DEDUCT ALT - Architectural Reductions (Lower Level)
  1. Base Bid: Interior renovations at the Lower Level per Package 2 set,
  2. Alternate: See also drawing AD101B-R.2, A101B-R.2; Respective MEP/FP/IT drawings
    - a. Reduction of scope at Lower Level (LL) as shown on drawings
    - b. Do not demolish existing walls except as required for (LL) restrooms and elevator modifications.
    - c. Provide abuse resistant GWB on furring at interior side of exterior walls in lieu of plaster repair at LL areas to be renovated.
    - d. Elec: same as base bid, except provide new lighting only at areas to be renovated and at stairs and as needed for egress/exits. See Electrical drawings.
    - e. Mech: No change from Base Bid. See Mech. drawings.
    - f. Plumb: No change from Base Bid. See Plumbing drawings

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

004114-4

CONSTRUCTION BID PROPOSAL

- g. Fire Protection: No change from Base Bid. See Fire Protection drawings.
- h. Fire Alarm: No change from Base Bid. See FA drawings
- i. Telecom: No change from Base Bid. See Telecom drawings.

AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_

- B. Alternate No. R2: ADD ALT – Additional scope at Lower Level
  - 1. Base Bid: Interior renovations at the Lower Level per Package 2 set
  - 2. Alternate: See also drawing AD101C-R.2, A101C-R.2; Respective MEP/FP/IT drawings per Base Bid.
    - a. Full lower-level renovation: Remove additional walls / reconfigure space at lower level as shown on drawings.

AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_

- C. Alternate No. R3: ADD ALT – Electrical localized lighting control.
  - 1. Base Bid: Centralized lighting control
  - 2. Alternate: Provide localized lighting control at public spaces as noted on drawings.

AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_

- D. Alternate No. S1: DEDUCT ALT – Playing Fields
  - 1. Base Bid: Artificial turf field including underground storm-water management.
  - 2. Alternate: Provide Natural Turf Field; reduce storm basin by 50%

AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_

- E. Alternate No. S2: DEDUCT ALT – Rec Center Frontage Paving
  - 1. Base Bid:
    - a. New concrete vehicular paving – extent as indicated on drawings.
    - b. Repairs to existing brick paving – extent as indicated on drawings.
  - 2. Alternate:
    - a. Provide asphalt vehicular paving in lieu of concrete.

AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_

- F. Alternate No. S3: ADD ALT – Tennis Courts
  - 1. Base Bid: No Scope
  - 2. Alternate:
    - a. Color coating and white line striping only.

AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_

- G. Alternate No. S4: ADD ALT – Diagonal path from 51<sup>st</sup> and Chester to playground
  - 1. Base Bid:
    - a. Diagonal Vehicular path: asphalt paving
    - b. Lighting: Install (5) PPR Standard pedestrian light posts

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

004114-5

CONSTRUCTION BID PROPOSAL

AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_

2. Alternate (Add):

- a. Install concrete pads, PPR Standard backless benches – (3) location as shown on landscape drawings L100-R.2
- b. Trash (1) and recycling (1) receptacles
- c. Install (5) Canopy trees

AMOUNT \_\_\_\_\_ DOLLARS, \$ \_\_\_\_\_

**SCHEDULE OF UNIT PRICES** (please refer to spec section 012200 UNIT PRICES for description)

- A. Unit Price No. 1: Repair of plaster – level 1 repair  
Description: Hairline cracks, small holes/bubbles:  
Unit of Measurement: Square foot of damage. \$ \_\_\_\_\_
  
- B. Unit Price No. 2: Repair of plaster – level 2 repair  
Description: Large cracks, loose plaster, water damage  
Unit of Measurement: Square foot of damage. \$ \_\_\_\_\_
  
- C. Unit Price No. 3: New openings in masonry walls  
Description: Provide opening and steel lintel per structural drawings.  
Unit of Measurement: Square foot of opening. \$ \_\_\_\_\_
  
- D. Unit Price No. 4: New furring over masonry walls  
Description: metal stud wall and 5/8” abuse-resistant GWB, installed full height to underside of structure.  
Unit of Measurement: Square foot of wall \$ \_\_\_\_\_
  
- E. Unit Price No. 5: Wood Floor repair  
Description: Repair of wood floors at gyms, and 2nd floor  
Unit of Measurement: Square foot of surface. \$ \_\_\_\_\_
  
- F. Unit Price No. 6: Underlayment  
Description: Provide new underlayment; remove deteriorated underlayment and install new.  
Unit of Measurement: Square foot of surface. \$ \_\_\_\_\_
  
- G. Unit Price No. 7: Brick Replacement – Site wall and select areas indicated on drawings.  
Description: Remove damaged brick and replace with new matching brick according to:  
Unit of Measurement: Each brick replaced. \$ \_\_\_\_\_
  
- H. Unit Price No. 8: Crack and spall repair - Brick – Site wall  
Description: Repairs per detail 1/S304-R.2

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

004114-6

CONSTRUCTION BID PROPOSAL

Unit of Measurement: Lineal foot of crack. \$ \_\_\_\_\_

- I. Unit Price No. 9: Mortar joint crack repair - Brick – Site wall  
Description: Repairs per detail 2/S304-R.2  
Unit of Measurement: Lineal foot of crack. \$ \_\_\_\_\_

- J. Unit Price No. 10: Dutchman repair – Limestone  
Description: Remove damaged stone and replace with new limestone dutchman with profiled and flat surfaces to match existing limestone according to the following Section and as indicated on structural Drawings.  
Unit of Measurement: Square foot of dutchman repair. \$ \_\_\_\_\_

- K. Unit Price No. 11: Dutchman repair – Granite.  
Description: Remove damaged stone and replace with new Granite dutchman with profiled and flat surfaces to match existing Granite according to the following Section and as indicated on structural Drawings.  
Unit of Measurement: Square foot of dutchman repair. \$ \_\_\_\_\_

- L. Unit Price No. 12: Repair of cracks with composite patching material – Granite.  
Description: Cut out material in surface crack and apply composite patching material and crushed granite to fill crack and shed water away from surface of building according to:  
Unit of Measurement: Lineal foot of crack repaired. \$ \_\_\_\_\_

- M. Unit Price No. 13: Repair of cracks with composite patching material – Granite.  
Description: Cut out material in surface crack and apply composite patching material and crushed granite to fill crack and shed water away from surface of building according to:  
Unit of Measurement: Lineal foot of crack repaired. \$ \_\_\_\_\_

- B.** I will substantially complete the Work, ready for final payment, in accordance with the Contract Documents within 250 consecutive calendar days counting from the date stated in the Notice to Proceed.

**C. ADDENDA**

Bidder must attach Addendum Acknowledgement sheets for all Addenda, if applicable.

**EXECUTION OF CONTRACT**

This contract consists of the Standard Contract Requirements; the Department’s Standard Details and Specifications, as they apply; the Department’s General Bidding and Contract Requirements; the Technical Specifications; the Bid; the Plans with all of the notes thereon (excluding any records or reports of test borings, underground structures, and test piles); any additional exhibits or attachments to any of the foregoing; and any addenda thereto issued by the PRA/City (collectively, the “Contract”).

NOTE: ANY CONTRACT THAT IS NOT EXECUTED IN ACCORDANCE WITH THE INSTRUCTIONS PROVIDED BELOW, MAY, IN THE SOLE DISCRETION OF THE PHILADELPHIA REDEVELOPMENT AUTHORITY, BE REJECTED.

**SIGNING OF CONTRACT**

If Contractor is an INDIVIDUAL or a PARTNERSHIP, date and sign the Contract here, with original signatures, in ink.

This \_\_\_\_\_ day of \_\_\_\_\_ 2019

\_\_\_\_\_  
(Signature of Owner, Partner)

\_\_\_\_\_  
(Type or Print Name and Title)

\_\_\_\_\_  
(Business Name of Bidder)

If Contractor is a CORPORATION, date and sign the Contract here with original signatures, in ink, by (a) President or Vice-President of the corporation AND (b) Secretary, Assistant Secretary, Treasurer or Assistant Treasurer of the corporation; and (c) affix the seal of the corporation. If the Contract is not signed by the President or Vice-President; and Secretary, Assistant Secretary; Treasurer or Assistant Treasurer, attach a duly certified corporate resolution authorizing the person signing in place of such officers to execute this Contract for the corporation.

This \_\_\_\_\_ day of \_\_\_\_\_ 2019

CORPORATE SEAL

\_\_\_\_\_  
(Corporate or Business Name of Bidder)

\_\_\_\_\_  
(Address, Including Zip Code)

\_\_\_\_\_  
(Telephone Number)

\_\_\_\_\_  
(Signature of President or Vice President)

\_\_\_\_\_  
(Signature of Secretary, Asst. Secretary, Treasurer or

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

004114-8

CONSTRUCTION BID PROPOSAL

Assistant Treasurer

---

(Type or Print Name and Title)

---

(Type or Print Name and Title)

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

004114-9

CONSTRUCTION BID PROPOSAL



SECTION 00 4313  
BID BOND

**PROJECT NAME: KINGSESSING RECREATION CENTER BUILING AND SITE IMPROVEMENTS**

FOR THE PHILADELPHIA REDEVELOPMENT AUTHORITY, KNOW ALL MEN BY THESE  
PRESENT, that we

\_\_\_\_\_

as Principal (hereinafter called the "Principal Obligor"), and \_\_\_\_\_

\_\_\_\_\_

Surety, are jointly and severally held firmly bound unto the Philadelphia Redevelopment Authority, in  
the sum of:

TEN PERCENT (10%) OF THE GROSS AMOUNT OF THE BID

lawful money in the United States of America, to be paid to the said Philadelphia  
Redevelopment Authority, its successors and assigns, to which payment well and truly to be made, we  
do bind ourselves and each of us, our and each of our successors and assigns, jointly and severally,  
firmly by these present.

Sealed with our seals and dated the \_\_\_\_\_ day of \_\_\_\_\_, A.D. 2019

WHEREAS, the above bonded Principal Obligor, submitted a bid pursuant to the above  
referenced Bid Number to perform certain work for the Philadelphia Redevelopment Authority.

NOW, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the Philadelphia Redevelopment  
Authority shall accept the bid of the Principal Obligor and the Principal Obligor shall enter into a contract  
with the Philadelphia Redevelopment Authority in accordance with the terms of such bid, and furnish  
such bond or bonds as are specified in the bid documents with good and sufficient surety, for the faithful  
performance of the contract and for the prompt payment of labor and material furnished in the  
prosecution thereof; or in the event of the failure or refusal of the Principal Obligor to enter such contract  
and give such bond or bonds, if the Principal Obligor shall pay to the Philadelphia Redevelopment  
Authority the difference between the amount specified in said bid and such larger amount for which the  
Philadelphia Redevelopment Authority may legally contract with another party to perform the work  
covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and  
effect.

And we do for ourselves and each of us, our and each of our heirs, executors, administrators,  
successors and assigns, hereby authorize and empower the Solicitor of Philadelphia Redevelopment  
Authority or any other attorney of any court of record in Pennsylvania or elsewhere by him or her  
deputized for the purpose, upon the filing of this instrument or a copy thereof, duly attested as correct  
by the Solicitor of the Philadelphia Redevelopment Authority, to appear for us or either of us, our or  
either of our heirs, executors, administrators, successors or assigns, and confess a judgment against  
us or either of us, our or either of our heirs, executors, administrators, successors or assigns, in favor  
of the Philadelphia Redevelopment Authority for the sum named in this bond, without defalcation, with  
costs of suit, release of errors, and with five percent added for collection fees; hereby waiving the benefit  
of all exemption laws and the holding of inquisition of any real estate that may be levied upon by virtue  
of such judgment, voluntarily condemning such real estate and authorizing the entry of such  
condemnation upon any writ of fieri facias and agreeing that said real estate may be sold under the

KINGSESSING RECREATION CENTER BUILING AND SITE IMPROVEMENTS  
00 4313-1  
BID BOND

same; and further waiving all errors, defects and imperfections whatsoever in the entering of the said judgment or any process thereon, and hereby agreeing that no writ of error or objection of motion or rule to open or strike off judgment or to stay execution or appeal, shall be made or taken thereto.

And for the doing of these acts, this instrument or a copy thereof attested as aforesaid shall be full warrant and authority.

CORPORATE SEAL:

PRINCIPAL OBLIGOR:

\_\_\_\_\_(SEAL)  
President or Vice President

\_\_\_\_\_(SEAL)  
Secretary or Treasurer  
(or either of their assistants)

\_\_\_\_\_(SEAL)  
Secretary or Treasurer

SURETY:

\_\_\_\_\_(SEAL)  
Attorney-In-Fact

- 
- Note: (1) All bidders must utilize this Bid Bond Form when submitting a bid to the Philadelphia Redevelopment Authority.
- (2) If Principal Obligor is an individual or partnership, Bid Bond should be signed by owner or authorized general partner. Please identify on the Bid Bond the type of business (e.g. individual proprietorship or partnership) and title of party executing the Bid Bond.
- (3) Bid Bond must be executed by a surety company duly authorized and licensed to act as surety by the Pennsylvania Insurance Commissioner pursuant to the laws of the Commonwealth of Pennsylvania.

END OF SECTION

SECTION 00 4322  
UNIT PRICES FORM

PARTICULARS

- 1.01 The following is the list of Unit Prices referenced in the bid submitted by:
- 1.02 (Bidder) \_\_\_\_\_
- 1.03 TO (Owner ): \_\_\_\_\_
- 1.04 dated \_\_\_\_\_ and which is an integral part of the Bid Form.
- 1.05 THE FOLLOWING ARE UNIT PRICES FOR SPECIFIC PORTIONS OF THE WORK AS LISTED, AND ARE APPLICABLE TO AUTHORIZED VARIATIONS FROM THE CONTRACT DOCUMENTS.

UNIT PRICE LIST

- 2.01 Refer to Unit Prices Section for list and use the following as basis for submission with Bid.
- 2.02 ITEM DESCRIPTION UNIT QUANTITY UNIT VALUE
- 2.03 \_\_\_\_\_
- 2.04 \_\_\_\_\_
- 2.05 \_\_\_\_\_
- 2.06 \_\_\_\_\_

END OF SECTION 00 4322

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SECTION 00 4323  
ALTERNATES FORM

PARTICULARS

- 1.01 THE FOLLOWING IS THE LIST OF ALTERNATES REFERENCED IN THE BID SUBMITTED BY:
- 1.02 (Bidder) \_\_\_\_\_
- 1.03 TO (Owner ): \_\_\_\_\_
- 1.04 Dated \_\_\_\_\_ and which is an integral part of the Bid Form.

ALTERNATES LIST

- 2.01 THE FOLLOWING AMOUNTS SHALL BE ADDED TO OR DEDUCTED FROM THE BID AMOUNT. REFER TO SECTION 01 2300 - Alternates.
- A. ALTERNATE #R1: ~~ADD~~ / **(DEDUCT)** \$ \_\_\_\_\_
  - B. ALTERNATE #R2: **ADD** / ~~(DEDUCT)~~ \$ \_\_\_\_\_
  - C. ALTERNATE #R3: **ADD** / ~~(DEDUCT)~~ \$ \_\_\_\_\_
  - D. ALTERNATE #R3: **ADD** / ~~(DEDUCT)~~ \$ \_\_\_\_\_
  - E. ALTERNATE #S1: ~~ADD~~ / **(DEDUCT)** \$ \_\_\_\_\_
  - F. ALTERNATE #S2: ~~ADD~~ / **(DEDUCT)** \$ \_\_\_\_\_
  - G. ALTERNATE #S3: **ADD** / ~~(DEDUCT)~~ \$ \_\_\_\_\_
  - H. ALTERNATE #S4: **ADD** / ~~(DEDUCT)~~ \$ \_\_\_\_\_
  - I. ALTERNATE #S5: **ADD** / ~~(DEDUCT)~~ \$ \_\_\_\_\_

END OF SECTION 00 4323

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**CITY OF PHILADELPHIA**



**STANDARD CONTRACT REQUIREMENTS  
FOR PUBLIC WORKS CONTRACTS**

**PROCUREMENT DEPARTMENT**

August 25, 2021

**CITY OF PHILADELPHIA**  
**STANDARD CONTRACT REQUIREMENTS**

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## **STANDARD CONTRACT REQUIREMENTS**

### **A. DEFINITIONS**

1. **Definitions.** The terms used in the Contract Documents shall have the following meanings:
  - a. "ADA" has the meaning set forth in Paragraph 113 below.
  - b. "Amendment" means a written modification or change to any Contract Document signed by both Parties.
  - c. "Applicable Law" means all applicable present and future federal, state or local laws, ordinances, executive orders, rules, regulations and all court orders, injunctions, decrees and other official interpretations thereof of any federal, state or local court, administrative agency or governmental body, including the City of Philadelphia ("City"), the Commonwealth of Pennsylvania ("Commonwealth") and the United States of America ("USA"). Applicable Law includes, without limitation, laws, etc. relating to the environment, the Philadelphia Home Rule Charter ("HRC"), as amended from time to time, The Philadelphia Code ("Code"), as amended from time to time, and the specific laws set forth in Paragraphs 107–116 below, each as amended from time to time. Sellers submit quotes, and the parties execute, deliver and perform their respective obligations under the Contract, under and pursuant to the applicable provisions of all Acts of the General Assembly of the Commonwealth and applicable ordinances of the City, as such enactments may hereafter be supplemented or amended.
  - d. "Application for Final Estimate" has the meaning set forth in Paragraph 56 below.
  - e. "Application for Payment" has the meaning set forth in Paragraph 52 below.
  - f. "Application for Semi-Final Estimate" has the meaning set forth in Paragraph 55 below.
  - g. "Bid Solicitation" means a public invitation to submit competitive Quotes for a specific City contract or City contracts that is or are issued by the Procurement Department in accordance with Sections 8-200(1), 2(a) and 2(b) of the Philadelphia Home Rule Charter. A Bid Solicitation includes all addenda thereto issued by the Procurement Department.
  - h. "Change Order" means an instrument altering the scope of the work under the Contract issued under Paragraph 48 below.
  - i. The "City" means The City of Philadelphia, a corporation and body politic existing under the laws of the Commonwealth, and includes its various executive and administrative departments, agencies, boards and commissions, including the Department, and its legislature, City Council. The City is a City of the First Class under the laws of the Commonwealth.
  - j. "City Work" has the meaning specified in Paragraph 107(d) below.
  - k. "Contingent Price" means a price for a unit or component of work specified on the "Contingent Price List" published from time to time by the City.
  - l. "Commonwealth" means the Commonwealth of Pennsylvania.
  - m. "Contract" means the agreement of the Parties evidenced by the Contract Documents.
  - n. "Contract Documents" means the Standard Contract Requirements; the Department's Standard Details and Specifications, as they apply; the Department's General Bidding and Contract Requirements; the Technical Specifications; the Quote; the Plans with all of the notes thereon (excluding any records or reports of test borings, underground structures, and test piles); the Notice to Proceed ("NTP"), the Notice of Contract Award

("NCA"), the performance bond and the payment bond, as prepared by the Department and issued with the Bid Solicitation, and includes all exhibits, schedules and addenda, if any, to any of the foregoing documents, and any and all Amendments and Change Orders.

o. "Contractor" means the Person that has entered into the Contract with the City, has had its authorized individual(s) sign the Contract Documents on behalf of the Person but does not include, without the City's written consent, any subsidiary, affiliate, agent, etc., or parent company, if any, of the Contractor.

p. "Current Estimate" has the meaning set forth in Paragraph 53 below.

q. "Demographic Data" means statistical information on a group of individuals, aggregated by specific characteristics, including but not limited to race, ethnicity, gender identity, job title, salary range, length of employment, Philadelphia residence, and such other categories as may be established by regulation.

r. "Department" means the department, board, commission, or agency of the City for which the Contractor carries out the work under the Contract, except when the Department of Public Property ("DPP") supervises the Contract, in which case "Department" means the Department of Public Property.

s. "Disputed Change Order" means a Change Order issued by the City under Paragraph 49 below.

t. "Event of Insolvency" means (a) the filing of a voluntary petition by the Contractor under the Federal Bankruptcy Code or any similar state or federal law; or (b) the filing of an involuntary petition against The Contractor under the Federal Bankruptcy Code or any similar state or federal law which remains undismissed for a period of forty-five (45) days; or (c) the Contractor's making of an assignment for the benefit of creditors; or (d) the appointment of a receiver for the Contractor or for the property or assets of the Contractor, if such appointment is not vacated within forty-five (45) days thereafter; or (e) any other proceeding under any bankruptcy or insolvency law or liquidation law, voluntary or otherwise; or (f) the Contractor proves unable to pay its obligations as they mature; or (g) the Contractor is insolvent as otherwise defined under any Applicable Law.

u. "General Bidding and Contract Requirements" means the additional bidding and contract conditions and requirements specifically prepared by the Department for a specific Bid Solicitation (which may accompany the Technical Specifications) and may from time to time include, but not be limited to, Quote proposal forms, special or additional or supplementary instructions to Sellers, minimum wage rate schedules, prevailing wage rate schedules, contingent price lists, requirements of the City's Office of Economic Opportunity ("OEO"), and general tax requirements.

v. "Inspector" means the representative of the City's Project Manager assigned to inspect work and the delivery of services under the Contract.

w. "Labor Source" means a defined pool of trained and qualified individuals from which workers can be secured by agreement or through other means from an entity other than the contractor itself, including but not limited to a business, union hiring hall, job training organization, or registered apprenticeship program.

x. "Lump Sum Bid Breakdown" has the meaning set forth in Paragraph 52 below.

y. "Notice of Contract Award" (NCA) means a notice from the City to the Seller informing the Seller of the City's determination to award the Contract to the Seller.

z. "Notice to Proceed" (NTP) means a notice from the City to the Contractor authorizing the Contractor to commence work under the Contract.

aa. "Operating Commissioner" means the director, commissioner, or other head of the Department issuing the work to the Contractor pursuant to the Contract.

- bb. "Parties" means the City and the Contractor, and a "Party" means either the City or the Contractor.
- cc. "Person" means any individual, sole proprietorship, association, company, firm, partnership, limited partnership, joint venture, corporation, limited liability company or other form of entity or association recognized at law.
- dd. "PGW" means the Philadelphia Gas Works.
- ee. "Plans" means the general plans and design drawings which accompany the Technical Specifications, the Standard Details and Specifications, and such detail and supplementary drawings as may be furnished from time to time.
- ff. "Procurement Commissioner" means the head of the City's Procurement Department, or his or her designee.
- gg. "Procurement Department" means the Procurement Department of the City.
- hh. "Project" means all of the work which the City seeks to complete at the Project site, including, but not limited to, the work which the Contractor has agreed to perform under the Contract. The Project includes other work at the Project site by the City and by other contractors pursuant to other City contracts.
- ii. "Project Manager" means the designated representative of the City officer in charge of the construction branch, division or unit of the Department, or the individual specifically designated as "Project Manager" in the Technical Specifications, and any other individual who may be designated in writing by the Project Manager as his or her representative. The City may delegate or provide for the performance of certain of the duties and functions of the Project Manager by architectural or engineering firms under contract with the City.
- jj. "Proposal" means a Seller's price and other specific terms and conditions included in a Quote.
- kk. "Public Works Contract(s)" means any contract awarded by the Procurement Department for the construction, reconstruction, alteration, or repair of any public building or other public work or public improvement within the City and County of Philadelphia.
- ll. "Quote" means a Seller's signed response, including a Proposal, submitted to the Procurement Department pursuant to a Bid Solicitation.
- mm. "Report Date" means December 31<sup>st</sup> of the calendar year, immediately preceding the date the bid is filed.
- nn. "Responsibility" or "Responsible" means the capacity to perform a City contract in accordance with its terms and conditions. Elements of Responsibility include the following, among others: judgment, skill, promptness, faithfulness, skillful workers, honesty of the Contractor, financial standing, reputation, experience, resources, facilities, past history of adherence to plans and specifications, capacity and ability to do the work according to the plans and specifications, availability and efficiency, and such other factors as may be determined by law and the City.
- oo. "Seller" means a Person submitting a Quote, signed by the Person, to the Procurement Department pursuant to a Bid Solicitation. Seller includes only the Person who signs the Contract. Seller does not include, without the written consent of the City, any subsidiary, affiliate, agent, etc., or parent company, if any, of the Person.
- pp. "Semi-Final Estimate" has the meaning set forth in Paragraph 55.
- qq. "Shop Drawings" means all drawings, diagrams, illustrations, brochures, schedules, performance charts, instructions, and other data which are prepared by the Contractor, its Subcontractors, suppliers, or distributors, or equipment fabricators or manufacturers, and which illustrate the manufacture or fabrication of the product or equipment or any part thereof, and which are submitted to the Department to establish that the materials, articles and components of equipment Contractor proposes to supply will, when installed, meet all requirements of the Contract Documents.

oo. "Standard Contract Requirements" or "SCR" means these Standard Contract Requirements of the City in connection with the Bid Solicitations for, and the award, execution, and performance of Public Works Contracts, except as modified by the Department's General Bidding and Contract Requirements, the Technical Specifications and Plans and any other special requirements for the Contract. These Standard Contract Requirements are attached to and form an integral part of the Contract Documents.

rr. "Standard Details and Specifications" means the standard details and specifications for specific, recurring types of work or components thereof, as may be issued by the Department from time to time, *e.g.*, the Standard Details and Standard Specifications for Sewers, as issued by the Philadelphia Water Department, or the Standard Construction Items, as issued by the Department of Streets.

ss. "Structures" has the meaning set forth in Paragraph 83 below.

tt. "Subcontract" means a contract made between the Contractor and a Subcontractor, or between a Subcontractor and a sub-subcontractor at any tier, providing for the completion of one or more portions of the work which the Contractor has agreed to perform under the Contract, including agreements for the manufacture or supply of equipment, systems or components forming part of such work.

uu. "Subcontractor" means a Person performing at any tier under a contract with the Contractor or another Subcontractor one or more portions of the work which the Contractor has agreed to perform under the Contract. Subcontractors shall include, without limitation, vendors, manufacturers, suppliers, or other Persons contracting with a Subcontractor or the Contractor for the manufacture or supply of equipment, systems or components forming part of the work under the Contract. There is no contractual relationship (privity of contract) between the Contractor's Subcontractor, or a Subcontractor's subcontractor, and the City.

vv. "Substantial Completion" or "Substantially Complete" or "Substantially Completed" means that construction is sufficiently complete in accordance with Contract Documents and certified by the Project Manager, as modified by Change Orders or amendments, so that (a) the work under this Contract can be used, occupied or operated for its intended use, and (b) all applicable permits and licenses, including, if applicable, a statement or certificate of occupancy, shall have been duly issued by all government offices, including those of the City. In no event shall the Contract be certified as substantially complete until the Contractor has completed at least ninety percent (90%) of the work under the Contract.

ww. "Technical Specifications" means the written and detailed requirements, prepared by the Department, or its consultants or representatives, for materials, equipment, systems, standards and workmanship for the work under this Contract and related services to be performed under the Contract.

xx. "Unbalanced Quote" means an offer by the Contractor which (1) contains extremely low prices on items or types of work which are, as determined by the City in its sole discretion, unimportant or infrequently ordered or performed, and extremely high prices on items or types of work which are frequently ordered or performed, resulting in an effort to qualify as the low Seller while charging disproportionately high prices for certain items or types of work; or (2) contains prices for phases of the work to be performed early in the course of the work under this Contract that are, as determined by the City in its sole discretion, disproportionately high relative to prices for later phases of the work, resulting in payment of a disproportionately high percentage of the total Contract price early in the Contract period.

yy. "Working Days" means calendar days, less allowances for days or parts of days, in increments of one-quarter (1/4) day, for conditions entirely beyond the control of the Contractor as defined in Paragraph 25(c)(2); and also excludes New Year's Day, Memorial Day, July 4<sup>th</sup>, Labor Day, Thanksgiving Day and Christmas Day, or the Monday thereafter when these days occur on Sunday, and Saturdays and Sundays shall not be considered as Working Days.

xx. "Working Drawings" means those drawings prepared by the Contractor to supplement the Plans and Shop Drawings to accurately and clearly depict all working and installation dimensions, arrangement and sectional views, units of equipment in the proposed positions for installation, details of required attachments and connections, and dimensioned locations between units and in relation to the existing and proposed structures. Working Drawings shall show all necessary details and information for making connections between the various

trades including, but not limited to, power supplies and interconnecting wiring between units, accessories, and appurtenances.

2. **Interpretation; number, gender.** The words "herein" "hereof" and "hereunder" and other words of similar import refer to the Contract as a whole, including all of the Contract Documents, and not to any particular article, paragraph, subparagraph or clause contained in the Contract Documents. Whenever the context requires, words used in the singular shall be construed to include the plural and vice versa, and pronouns of any gender shall be deemed to include the masculine, feminine and neuter genders.

## **B. QUOTE SUBMISSION REQUIREMENTS**

### **3. Qualifications of Seller.**

a. Each Seller must demonstrate to the satisfaction of the City that it is Responsible, capable of performing the work under the Contract, and has successfully completed contracts equivalent in scope and nature, and comparable in magnitude. Seller must further demonstrate that: 1) it has the necessary financial resources, equipment, and workforce to perform the work under the Contract in a proper and satisfactory manner, in accordance with the Contract Documents, and within the time specified, and 2) that the possible award of this Contract to the Seller will not, in the City's sole discretion, overextend the Seller because it is already performing another City contract or other contract(s) or project(s).

b. As required by Section 17-101, as amended, of The Philadelphia Code, entitled "Prequalification of Prospective Bidders for Contracts for Construction of Public Works", all Sellers shall submit to the Procurement Department through PHLContracts, by the date specified in the Quote advertisement(s), a "City of Philadelphia Prequalification Questionnaire," for the purpose of determining the Seller's Responsibility. Should the Seller omit any required information, or refuse to give any required information, or should the information submitted by Seller, in the judgment of the Procurement Commissioner, taking into consideration the recommendations of the Operating Commissioner, reveal that the Seller is not sufficiently equipped or qualified to enter into or perform the Contract, the City shall not accept any Quote from such Seller(s), and the Procurement Commissioner shall notify the Seller to that effect. In such case, Section 17-101 of The Philadelphia Code shall govern any appeal to which the Seller may be entitled.

### **4. Examination of Contract Documents and Site.**

a. Sellers shall thoroughly acquaint themselves with the Contract Documents, including, without limitation, a careful study and review of the Plans and Technical Specifications. Sellers shall examine in detail the Project site and shall acquaint themselves with conditions affecting the work under the Contract and the overall Project, and, when applicable, the condition of walls and foundations of overlying and adjacent structures, the character of the paving, and the soil and subsurface soil. The Quote shall be prepared with due regard to the provisions of the Contract Documents and to the conditions existing or to be anticipated at the Project site.

b. Where test borings, test piles, and existing underground and above-ground structure locations are reported on, or included with, the Contract Plans or Technical Specifications, or where they are provided as separate Plans or Technical Specifications, they are for the information of the City only and are not provided to Sellers to show the conditions to be encountered by the Seller; the correctness, accuracy, or interpretation of the information is not guaranteed or warranted in any fashion by the City; and in no event is any boring or underground or above-ground structure information to be considered as a part of the Contract, notwithstanding any provision to the contrary that may appear in the Technical Specifications. If a Seller uses any of this information in preparing its Quote, Seller shall assume any and all risks resulting from conditions that differ from the conditions or approximation shown on the Plans or Shop Drawings.

1. If Seller desires to obtain similar data or information, or to conduct an independent subsurface investigation of the Project site, the Seller must notify the Department in writing at least ten (10) days prior to the date for opening of Quotes, or not later than five (5) days after the date on which Quotes are first advertised by the City, whichever date is earlier. Upon written notice from Seller, the City shall afford Seller the opportunity, at Seller's sole expense, to make test borings or soundings, to drive test piles, or to dig test pits on that portion of the Project site in which the work under this Contract will take place. Seller shall be responsible for complying with all Applicable Law relating to such activity. The foregoing to the contrary notwithstanding, the

City reserves the right to reject such investigations by any Seller when the City deems such rejection to be in the City's best interest. If the City permits such investigations by any Seller, then (a) each such Seller, prior to its entry onto the Project site, shall deliver to the City a certificate of insurance conforming to the

requirements of Paragraph 30 below, and a License Agreement in the form provided by the City; (b) each such Seller shall indemnify, defend and hold the City harmless from and against any and all claims, causes of action, suits, damages, losses, costs and expenses, whether for personal injury or property damage or for any other reason, arising out of such Seller's entry on the Project site; (c) such Seller covenants and agrees that it shall restore the Project site to the same condition as existed prior to such Seller's entry onto the Project site; (d) the City reserves the right to require the delivery of payment and performance bonds prior to any entry onto the Project site by such Seller; (e) in the event more than one Seller seeks to conduct such investigations, the City reserves the right to coordinate and schedule such investigations so as to minimize interference with the use of the Project site and other adjacent sites and any interference with other work at the Project site or adjacent to the Project site.

2. Failure of a Seller to notify the Department in writing of a Seller's desire to obtain such information shall operate as an absolute bar to any claim by a Seller that it had no reasonable means of making an independent subsurface investigation of the site.

c. If a Seller discovers or encounters any ambiguity or discrepancy in the Contract Documents in the course of preparing its Quote, the Seller shall promptly notify the Department of the ambiguity or discrepancy prior to the date and time for receipt and opening of Quotes. The City, so advised, may, at its sole discretion determine whether such ambiguity or discrepancy exists and whether any corrective action is necessary.

5. **Antibid-Rigging Act.** All Sellers, by submitting a Quote, certify that they have not committed or engaged in, or attempted to commit or engage in, a prohibited activity under the Antibid-Rigging Act, 62 Pa. C.S.A. § 4501, et seq., as amended, in connection with their Quote. In addition, all Sellers by submitting a Quote certify that the Seller has not been convicted or found liable for any act prohibited by any federal or state law in any jurisdiction involving conspiracy or collusion with respect to bidding on any public contract within the five (5) years prior to the date of the Quote; that the Seller acknowledges that a conviction or finding of liability for any act prohibited by federal or state law in any jurisdiction involving conspiracy or collusion with respect to submitting a Quote on any public contract within the three (3) years prior to the date of the Quote shall not prohibit the City from accepting a Quote from the Seller or awarding a Contract to the Seller, but may nonetheless serve as grounds for Seller's suspension or debarment at the sole discretion of the Procurement Commissioner, or may serve as grounds for a non-award of a Contract to the Seller on the basis of the Seller's lack of Responsibility.

6. **Multiple Quote Restriction.** No Seller shall be a party to more than one (1) Quote for the same Bid Solicitation. A violation of this condition may in the sole discretion of the Procurement Commissioner, result in rejection of any or all such Quotes in which the Seller is interested.

7. **Quote Submission.**

a. By submitting a Quote, the Seller certifies that it is familiar with the Project site and the conditions affecting the Project site, that it has thoroughly reviewed the Contract Documents, and that all work can be completed for the amount stated in the Quote and within the Contract time specified. No Quote may be considered if received after the date and time for opening of Quotes established by the Bid Solicitation, nor may any Quote be modified after that date and time, except as provided herein or by Applicable Law. The time of Quote opening shall be the time displayed in PHLContracts. In the event of any discrepancy between actual time and the time displayed in PHLContracts, the latter shall determine the time of Quote opening.

b. It is the sole responsibility of the Seller to ensure that it has received any and all addenda and the Procurement Commissioner may, in his or her discretion, reject any Quote for which all addenda have not been executed and returned in accordance with the instructions provided therein.

c. For purposes of determining the basis of a contract award, in the event of a discrepancy between a unit price and an extended price for a work or line item, the unit price shall govern, and the extended price shall be re-computed by the City. If the amount set forth as a unit price is ambiguous, unintelligible, or uncertain for any cause, or is omitted entirely, or is the same amount as the extended price for a work or line item, then the amount set forth as the extended price shall govern for purposes of determining the basis of a contract award. In such event, the extended price shall be divided by the estimated quantity for the work or line item to

arrive at a re-computed unit price which shall thereafter govern for purposes of payment under Paragraph 45.

d. Where a unit or other price (including a unit price extension or the aggregate or total price) contained in the Quote contains a mistake or error in computation, or is otherwise ambiguous as to computation, or there is a discrepancy between a unit price and an extended price for a work or line item, and where the mistake, ambiguity, or discrepancy is not discovered prior to contract award and results in the award of a contract to the Seller, which award is later determined to be mistaken or erroneous, or the Contract Amount is determined to be erroneous, based upon a re-computation of the unit prices and the total price, the Contractor shall bear the sole financial risk of such mistake or ambiguity, and such mistake or ambiguity shall be construed solely against the Contractor and in favor of the City. In all such cases of price mistake, ambiguity, or discrepancy, if work under the Contract has not yet commenced, the City shall have the discretion, at its sole option, to formally rescind the Contract, if the Contractor is deemed not to be the low Seller in accordance with the rule set forth in Paragraph 7(c) above, or to unilaterally reform the Contract and the prices therein in accordance with the rule set forth in Paragraph 7(c), if the Contractor would still be deemed to be the low Seller notwithstanding any mistake, ambiguity, or discrepancy. If work under the Contract has already commenced, the City shall have the discretion, at its sole option, to make payment at the unit price as recomputed in accordance with Paragraph 7(c) above or at the mistaken or ambiguous unit price, or to dispute payment at the mistaken or ambiguous price. In the event of a rescission or reformation of the contract under this Paragraph, the Contractor agrees and acknowledges that it shall have no claim against the City, including any claim for breach of contract or breach of any other legal duty, or for lost profits, costs, damages, or expenses of any kind, arising out of the rescission or reformation. In the event that the City disputes payment to the Contractor at a mistaken or ambiguous unit price, and the parties cannot mutually agree upon a price to be paid to the Contractor for the item of work in question, the payment to the Contractor for the item of work shall not exceed the payment which would be made pursuant to Paragraph 51, and the City's liability to the Contractor for such item of work shall not in any event exceed the Contract Amount as specified in Paragraph 44.

**8. Quote Withdrawal.** P.L. 9, No. 4, Act of January 23, 1974, 73 P.S. § 1601, et seq., as amended, shall govern the withdrawal of Quotes for clerical mistakes. A Seller must provide the Procurement Department written notice of a right to withdraw a Quote under 73 P.S. § 1601, et seq., within two (2) business days after the opening of Quotes.

**9. Quote Responsiveness.** Subject to the right of the Procurement Commissioner to waive irregularities and non-responsiveness as set forth below in this Paragraph 9, the Contract Documents are mandatory and must be strictly followed by all Sellers in the preparation and submission of their Quotes. After Quotes are opened, the Procurement Department, and other City departments or agencies where appropriate or specified, shall review all Quotes for responsiveness. Any Quote which is incomplete, obscure, conditional, unbalanced, which contains additions not called for, or irregularities of any kind, including alterations or erasures, or which fails to conform in any respect to the Contract Documents shall be deemed to be non-responsive and shall be rejected, except where the Procurement Commissioner, in his or her sole discretion, determines that the irregularity or non-responsiveness is not material or that a waiver of the irregularity or non-responsiveness is otherwise permitted by the Contract Documents or by Applicable Law. The Procurement Commissioner reserves the right to waive such irregularities or non-responsive matters in a Quote. The Procurement Department's determination of non-responsiveness shall be final and any Quote rejected as non-responsive shall not be eligible for Contract award. The Procurement Commissioner's determination of non-responsiveness is not appealable to the Court of Common Pleas.

**10. Security for Execution of Contract.** The Seller shall include with its Quote a bid bond in the amount of ten percent (10%) of the gross amount of the Quote. The gross amount of the Quote shall mean the sum of all items enumerated in the Quote, without reduction for "deduct" alternates. All Sellers must use the City's standard bid bond form, which is included in the Bid Solicitation or otherwise available at the City's Procurement Information Center (Rm. 170 Municipal Services Bldg.), in fulfilling the requirement of this Paragraph 10. The City shall not accept any other bid bond form. The Seller may not submit cash. Upon return of the duly executed Contract Documents by the lowest responsible Seller to the City's Law Department, the bid bonds of all Sellers shall be deemed released.



**11. Bid Processing Fee.**

a. In addition to bid security and any other fee or monies required, the Quote shall be accompanied by a non-refundable processing fee in the form of a separate check payable to the City or electronic payment as specified in the bid solicitation. The processing fee is based on the advertised cost estimate for the bid in accordance with the formula below. Cash is not acceptable.

\$0	when the advertised cost estimate does not exceed \$10,000
\$10	when the advertised cost estimate is or exceeds \$10,000 but does not exceed \$100,000
\$30	when the advertised cost estimate is or exceeds \$100,000 but does not exceed \$300,000
\$50	when the advertised cost estimate is or exceeds \$300,000 but does not exceed \$500,000
\$100	when the advertised cost estimate is or exceeds \$500,000 but does not exceed \$1,000,000
\$200	when the advertised cost estimate is or exceeds \$1,000,000 but does not exceed \$2,000,000
\$300	when the advertised cost estimate is or exceeds \$2,000,000 but does not exceed \$3,000,000
\$400	when the advertised cost estimate is or exceeds \$3,000,000 but does not exceed \$4,000,000
\$500	when the advertised cost estimate is or exceeds \$4,000,000 but does not exceed \$5,000,000
\$600	when the advertised cost estimate is or exceeds \$5,000,000.

b. For the purpose of estimating the amount of the bid processing fee the amount of work and labor or the quantities of materials or supplies to be furnished will be in accordance with the estimated quantities, but the City will not be bound by such estimates in regard to the actual quantities of work and labor or materials or supplies required to be furnished under the Contract.

c. Failure to submit the bid processing fee may result in the Seller's disqualification from submitting a Quote. In addition, if an award is made pursuant to the Bid Solicitation and Quote, any unpaid processing fees owed by the Seller to the City must be paid prior to the City's release of any payments to the Contractor under the Contract.

12. **Business Tax Requirements.** Any Contractor, or vendor of goods, wares and merchandise, or purveyor of services, who submits a Quote and is awarded a contract by the City or the School District of Philadelphia ("School District" or "SDP"), is subject to Philadelphia's business tax and applicable ordinances and regulations. Anyone who is awarded a contract by the City or the School District of Philadelphia pursuant to a formal bid solicitation, including a Bid Solicitation, shall be deemed to have entered into a contract within the City, and the subsequent delivery of goods into the City, or performance of services within the City constitutes "doing business" in the City and subjects the successful Seller to one or more of the following taxes: (a) Business Privilege Tax; (b) Net Profits Tax; and (c) City Wage Tax. The successful Seller, if not already paying the aforesaid taxes, is required to apply to the Department of Revenue for a tax identification number and to file appropriate business tax returns as provided by law.

13. **Tax Indebtedness.** The successful Seller shall represent, warrant and covenant that the Contractor and any entities controlling the Contractor, under common control with the Contractor, or controlled by the Contractor are not currently indebted to the City, and will not at any time during the term of the Contract be indebted to the City, and will not at any time during the term of this Contract (including any extensions or renewals thereof) be indebted to the City, for or on account of any delinquent taxes (including, but not limited to, taxes collected by the City on behalf of the School District of Philadelphia), liens, judgments, fees or other debts for which no written agreement or payment plan satisfactory to the City has been established. In addition to any other rights or remedies available to the City at law or in equity, the Contractor acknowledges that any breach or failure to conform to this representation, warranty and covenant may, at the option of the City, result in the withholding of payments otherwise due to the Contractor and, if such breach or failure is not resolved to the City's satisfaction within a reasonable time period specified by the City in writing, may result in the offset of any such indebtedness against said payments or the termination of this Contract for default (in which case the Contractor shall be liable for all excess costs and other damages resulting from the termination), or both.

14. **Commercial Activity License.** A Commercial Activity License ("CAL") is required for every Person desiring to engage in any business within the City, whether or not such Person maintains a place of business in the City. The successful Seller will be required to furnish a CAL number at the time of Contract

award, but no later than before the "Notice to Proceed" is issued. In the event the successful Seller has applied for, but not been issued, a CAL, a photocopy of the application will be acceptable. The CAL is a one-time license with no expiration date. Only one (1) license is needed for multiple locations or for multiple businesses for the same Person. If the Seller has never had a CAL assigned, the Seller may request one by filing a "Miscellaneous License Application". In order to be assigned a CAL, it is necessary to have a "Philadelphia Business Tax Account Number". This is a number assigned by the City's Department of Revenue to identify City tax accounts. If the Seller has never had a number assigned, the Seller may request one by filing an "Application for Philadelphia Business Tax Account Number". Any tax account previously opened for the Seller which is unsettled or delinquent will cause delay and may preclude the issuance of a new license. Applications may be obtained from the Department of Licenses and Inspection, License Issuance Unit.

15. **Comparison of Quotes.** Quotes will be compared on the basis of the aggregate of all the items of the Quote, unless otherwise specified in the General Bidding and Contract Requirements.

16. **Award of Contract.** The City shall make the Contract award to the lowest responsive, Responsible Seller. In the event of an absolute tie, the Procurement Commissioner shall make the Contract award in accordance with the best interests of the City. The Procurement Commissioner, in his or her sole discretion, may reject all Quotes, if deemed in the best interests of the City. The award of the Contract shall be governed in all respects by 62 Pa.C.S. §3911, as amended. However, the failure of the City to comply with the statutory requirement set forth in 62 Pa.C.S. §3911 shall not operate as a release of the Seller, unless the Seller shall first notify the City in writing, prior to the end of the deadline set forth in 62 Pa.C.S. §3911, of the Seller's intent to demand compliance of the City with such requirement.

17. **Binding Contract and Execution of the Contract.**

a. The award shall not become a contract binding upon the City until after written Notice of Contract Award is made by the Procurement Department to the lowest responsive, Responsible Seller and until after all of the following conditions have been satisfied:

1. Successful Seller posts a proper performance bond and a proper payment bond, as provided for in Paragraph 18 below, on the City's current bond forms, within the time set forth in the Notice of Contract Award;
2. Successful Seller provides proof of the requisite insurance;
3. The Contract is approved as to form by the City's Law Department;
4. The Director of Finance and the City Controller's Office certify the availability of funds for the Contract; and
5. The Procurement Commissioner executes the Contract.

The Procurement Commissioner may, in his or her sole discretion, cancel any contract award if any of the above conditions are not satisfied, or if the Procurement Commissioner, in his or her sole discretion, determines cancellation of the contract award to be in the best interests of the City. In the event of such cancellation, the successful Seller agrees and acknowledges that it shall have no claim against the City, including any claim for breach of contract or breach of any other legal duty, or for lost profits, costs, damages, or expenses of any kind.

b. The execution of the Contract shall be made within sixty (60) days of the date of the award of the Contract and shall in any event be governed in all respects by 62 Pa.C.S. §3912, as amended. Any Seller who is not lawfully released from its Quote and who fails, refuses, or is unable to furnish the required performance and payment bonds or insurance, shall be liable to the City for the actual loss or damage sustained by the City as a result of the failure of the Seller to enter into the Contract. This remedy against the Seller shall be in addition to, and not in lieu of, any remedy or claim which the City may have under the bid bond posted by the Seller.

c. In no event shall the Contract awarded to the Contractor be construed or deemed to include, as a term, covenant or condition, any exception, addition or other term which the Seller may have included or as part of its Quote, except as may be expressly approved by the Procurement Commissioner pursuant to Paragraph 9 above.

18. **Contract Surety.** As provided by the Act of 1967, December 20, P.L. 869 (8 P.S. § 193.1, *et seq.*, as amended), the successful Seller will be required at the time of execution of the Contract to give security for the faithful performance of the work and for compliance with the Contract in the form of a performance bond, with a surety company approved by the City, in a sum equal to 100% of the amount of the Contract (equal to the Quote amount plus any contingency amount). In addition, as provided by the Act of 1967, December 20, P.L. 869 (8 P.S. § 193.1, as amended), the Contractor will be required at the time of execution of the Contract to give a payment bond, with a surety company approved by the City, in a sum one hundred percent (100%) of the amount of the Contract (equal to the Quote amount plus any contingency amount), conditioned for the full payment of Subcontractors and others furnishing labor and materials in the performance of the Contract. Both the performance and payment bonds must be submitted by the Seller to the City on bond forms provided by the City.

### C. **GENERAL REQUIREMENTS OF THE CONTRACT**

19. **Unauthorized Acts.** Any act of any City representative, official, agent, or employee, which is not within the scope of his or her authority as set forth in the Contract Documents or pursuant to the Philadelphia Home Rule Charter, shall not be binding on the City and shall not be deemed as a defense to the Contractor for the breach of any of the terms and conditions of the Contract.

20. **Cancellation of the Contract.** The Contractor will not be required to proceed with the work of the Contract, if:

- a. for any reason for which the Contractor it is not responsible, the Contractor cannot commence work within three (3) months from the date of execution of the Contract, except in the case of Contracts for street improvements, when six (6) months shall be the limiting period; or
- b. at any time prior to the issuance of the Notice to Proceed, the City, in its sole discretion, determines that it must reduce the scope of the work in an amount equal to or greater than twenty-five percent (25%) of the amount of the Quote. In such event, the City shall give notice thereof the Contractor.

In the event the Contractor cannot commence work, the Contractor shall give notice of cancellation within five (5) days after the date which is three (3) months from the date of execution of the Contract by the Contractor, except in the case of Contracts for street improvements, when the Contractor shall give such notice six (6) months from the date of execution of the Contract by the Contractor. In the event the City gives notice to the Contractor that the City has determined to reduce the scope of the work as provided in Paragraph 20(b) above, then the Contractor shall give notice of cancellation within five (5) days after the date the Contractor receives such notice from the City, otherwise the Contract shall remain valid.

This Paragraph 20 shall not apply to Contracts entered into for work the commencement of which is dependent upon progress of other contracts where this condition is plainly indicated by the character and location of such work at the time the City issues the Bid Solicitation and where Departmental constraints limit construction activities as described in the Technical Specifications. The City shall have no liability, by way of any penalty or otherwise, arising out of the cancellation of the Contract pursuant to this Paragraph 20.

21. **Termination for the Convenience of the City.** The City may terminate this Contract at any time during the term of the Contract, for any reason, including, without limitation, the City's own convenience. Written notice of termination shall be sent to the Contractor by the Procurement Commissioner and said notice shall set forth the effective date of the termination. Upon receipt of such notice of termination, the Contractor shall stop all work under the Contract. Upon termination under this Paragraph, the City shall be liable to the Contractor only for the cost and profit on the physical work then completed on the job site by the Contractor

and in place. The City shall have no additional liability or cost for termination of the Contract, including, but not limited to, any penalty, the Contractor's anticipated profits, the Contractor's estimating costs, or any loss on the work terminated. If termination of the Contract occurs prior to the issuance of the Notice to Proceed, the City shall not be liable to the Contractor for any cost or lost profits of the Contractor, regardless of whether the Contractor may have performed some physical work, except where the Project Manager has otherwise authorized in writing the commencement of work by the Contractor, in which case the City's liability to the Contractor shall be governed by the prior terms of this Paragraph. Termination of the Contract shall not affect any obligation or liabilities of either Party accruing prior to termination.

22. **Contractor's Obligations.** The work to be done under the Contract is set forth in detail in the Contract Documents. The Contractor shall furnish all labor, materials, plant, tools and appliances, and shall complete the work to the satisfaction of the Project Manager in the manner and within the time required in the Contract Documents at the prices set forth in the Contract. If at any time the Contractor's methods, workforce, or equipment appear to the Project Manager to be unsafe, insufficient, or inadequate for the proper performance of the provisions of the Contract, the Project Manager may order the Contractor to make such changes as the Project Manager may deem necessary, and the Contractor shall comply with such orders, but the failure of the Project Manager to make such demands shall not relieve the Contractor of its obligations under the Contract. The Contractor shall maintain an office on the Project site where orders and instructions may be delivered, and shall give personal attention to the faithful performance of the work of the Contract. The Contractor shall employ a competent representative or superintendent on the Project site who shall have full authority to receive and execute orders, and to supply such labor, tools, and materials as may be required for the proper performance of the work.

23. **Performance of Work by the Contractor.** The Contractor is required to perform, on the site and with its own work force, work with a value of at least twenty percent (20%) of the original total contract price, exclusive of profit, overhead and the costs of procuring insurance and bonds. The Contractor shall submit with its Quote a complete description of the work it will perform (e.g., earthwork, paving, brickwork, roofing, etc.), the percentage of the total work this represents, and the estimated dollar value thereof.

24. **Materials and Equipment Loaned or Rented by the City.** Any materials, or equipment loaned or rented by the City to the Contractor for use on the particular job must be returned by the Contractor in kind or in cash, or as a credit to the Contract as determined by the Department or the Contractor will be considered in default of the Contract. The use or operation of such material or equipment shall be at the Contractor's own risk. The material or equipment shall be taken in its "AS IS" condition and the Contractor shall maintain the material or equipment in the same condition as when received, less normal wear and tear. Should damage occur, repair or replacement shall be made by the Contractor at its own expense, at the election and to the satisfaction of the City, in accordance with specifications approved in writing by the City.

25. **Contract Time.**

a. Times set forth in the Contract Documents for the performance of the work or any portions thereof are essential elements of the Contract. The Contractor shall begin work within ten (10) days from the date of issuance of the Notice to Proceed from the Department directing the Contractor to proceed with the work, and shall complete all work covered by the Contract Documents within the time specified in the General Bidding and Contract Requirements. The Contract completion date shall be determined by reference to the date of the issuance to the Contractor of the Notice to Proceed. In submitting a Quote, the Contractor acknowledges and agrees that the Contract time, as specified in the General Bidding and Contract Requirements, is a reasonable period for performing the work.

b. Except as may otherwise be required by the General Bidding and Contract Requirements or the Technical Specifications, the Contractor shall prepare and submit to the Project Manager, before starting work, a written and detailed construction schedule which shall, at a minimum, indicate the milestone dates on which the Contractor intends to start and end each of the principal items of work under the Contract and which shall indicate generally how the Contractor intends to complete the work under the Contract within the Contract time specified. The Contractor's construction schedule shall include a schedule or timeline for submission of Shop Drawings or other submittals to the Department, which shall be coordinated with the overall construction schedule and which allows for a reasonable time for the Department or the Project Manager to review the

submittals or such time as the Department or the Project Manager may otherwise require pursuant to any of the Contract Documents. The Contractor's construction schedule shall in no event exceed the time allotted for completion of the Contract. From time to time, the Contractor shall revise and update its construction schedule to show changes to the schedule and any agreed revisions to the Contract time. The Contractor acknowledges that its failure to submit a written schedule to the Project Manager, as herein provided, shall preclude the assertion of any claims for delay or interference to Contractor's schedule or prosecution of the work and shall further preclude the assertion of any claim or request for an extension of the Contract time.

c. The Contractor shall be entitled to a reasonable extension of time for unavoidable delays or interference in completion of the Contract caused by:

1. Any acts or omissions of the City (but not PGW, or its contractors, or any other non-City utilities or authorities) which occur subsequent to the issuance of the Notice to Proceed and which cause delay in the completion of the Contract, by failure to give possession of the Project site, by changes in the Plans and Technical Specifications, or by requiring for any cause the suspension of the work under the Contract, except where such suspension is the result of a default or other act or omission by the Contractor. Any delay or postponement in the issuance of the Notice to Proceed shall not entitle the Contractor to an extension of the Contract time and shall not give rise to any claim for delay, disruption, or interference by the Contractor. The Contractor's remedies in the event of a delay or postponement in the issuance of the Notice to Proceed shall be governed solely by 62 Pa.C.S. §3913, as amended.

2. Causes not reasonably foreseeable by the Parties at the time of the complete execution of the Contract and which are entirely beyond the control and without the fault or negligence of the Contractor, including, but not limited to, acts of God, acts of the public enemy, acts of governmental authorities, quarantine restrictions, general strikes throughout the trade or freight embargoes not caused or participated in by the Contractor, fire, floods, pandemics and weather of unusual severity, such as hurricanes or tornados.

d. Delays caused by the Contractor's Subcontractors or materialmen shall not, in themselves, be cause for an extension of time by the City. To warrant an extension of time, such delays must be occasioned by the same causes specified in Paragraphs 25(c)(1) and (2) above.

e. Time extensions shall be handled as follows:

1. The Contractor, within five (5) days after the beginning of any delay or interference to its construction schedule, shall notify the Project Manager in writing of the occurrence of the delay or interference, stating with reasonable particularity the cause or causes of the delay or interference and the Contractor's intention to seek an extension of time.

2. Any claim by the Contractor for a time extension must be made in writing to the Project Manager within ten (10) days after the conclusion of the delay or interference for which a time extension is requested or the City will not consider such claim. The City shall not in any event grant a time extension for any delay or interference which was incurred more than five (5) days before the Contractor gave written notice as required in subparagraph (1) above.

3. Before the Project Manager reviews a claim for a time extension, the Contractor shall demonstrate in writing the effect of the delay or interference on the Contractor's construction schedule, including plotting such effect on the Contractor's critical path documents, showing graphically therein the effect on the Contract completion date, both in calendar days and Working Days. This depiction of the delay or interference must accompany the written claim for a time extension submitted in accordance with subparagraph (2) above. If the Contractor believes that it has been impacted beyond a mere time delay, the Contractor shall also provide the Project Manager with an estimate of the costs incurred by the Contractor as a result of the delay or interference. The failure of the Contractor to provide the Project Manager with this contemporaneous cost estimate shall bar any later claim by the Contractor for any costs incurred as a result of the delay or interference.

4. If the Project Manager determines that an extension of time is in order, the time allowed for any delay will be added to and will correspondingly extend the Contract time for completion and

adjust any Contract completion milestones set forth in the General Bidding and Contract Requirements or the Technical Specifications. The Contractor agrees that a time extension granted by the Project Manager shall be its sole remedy for a delay or interference and shall operate as a full and complete release of any claim by Contractor for any and all costs and expenses related to or arising out of the event giving rise to the delay or interference.

f. NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED HEREIN, THE CONTRACTOR AGREES AND ACKNOWLEDGES THAT THERE SHALL BE NO PAYMENT OR COMPENSATION OF ANY KIND TO THE CONTRACTOR FOR DAMAGES OR COSTS ARISING FROM ANY DELAY OR INTERFERENCE WHETHER SUCH DELAY IS AVOIDABLE OR UNAVOIDABLE. CONTRACTOR FURTHER AGREES AND ACKNOWLEDGES THAT ITS SOLE REMEDY IN THE CASE OF DELAYS OR INTERFERENCES TO ITS CONSTRUCTION SCHEDULE WHICH ARE ATTRIBUTABLE TO THE CITY, SHALL BE A REASONABLE EXTENSION OF THE CONTRACT TIME.

g. On contracts on a calendar day basis (a specified number of days), no allowance will be made for Saturdays, Sundays or holidays. On contracts on a Working Day basis, allowances will be made for days or parts of days, in increments of one-quarter (1/4) day, for conditions entirely beyond the control of the Contractor; New Year's Day, Memorial Day, July 4<sup>th</sup>, Labor Day, Thanksgiving Day and Christmas Day, or the Monday thereafter when these days occur on Sunday, and Saturdays and Sundays shall not be considered as Working Days. The Department shall keep a record of the Working Days and the Department shall make this record available to the Contractor on request. The Contract time shall start with the first Working Day after the date of the Notice to Proceed and the scheduled date of completion shall be that established by the specified number of Working Days plus the allowance.

h. If, for reasons other than those stated above, any portion of the work remains uncompleted after the Contract date specified for its completion, notwithstanding Substantial Completion of the work, the Project Manager shall deduct from payments due the Contractor, as liquidated damages an amount per diem, according to the following schedule:

<u>Contract Value</u>	<u>Agreed Delay Damages Per Diem</u>
\$0-\$100,000	\$ 250
\$100,001-\$500,000	\$ 500
\$500,001-\$1,000,000	\$ 750
Over \$1,000,000	\$1,000

These per diem delay damages are assessed as agreed liquidated damages because the Parties have considered the difficulty of determining the City's actual damages and agreed that computation of the City's actual damages is impossible. If a delay is due to causes which the Contractor considers extraordinary or beyond its control, the Contractor must give timely notice thereof in writing as specified in Paragraph 25(e) above. In the event that the General Bidding and Contract Requirements or the Technical Specifications contain a provision allowing for the imposition of liquidated damages for delays to the completion of the work, such provision shall take precedence over this subparagraph (h).

This subparagraph (h) shall not be construed to apply to claims, offsets, credit change orders, and/or chargebacks which the City may assert or assess against any Contractor for the reimbursement or recovery of any costs incurred by a different Contractor on the Project due to the fault or delay of the Contractor. In all such cases, the City shall not be limited to the per diem amounts listed above and shall be permitted to seek recovery or reimbursement of the full amounts incurred by any non-delaying Contractor.

26. **Independent Contractor.** The Contractor is an independent contractor and shall not in any way or for any purpose be deemed or intended to be an employee or agent of the City. Neither the Contractor nor its employees or Subcontractors shall in any way represent that they are acting as employees, officials or agents of the City.

27. **Risk of Loss.** The Contractor shall assume all risk and responsibility for casualties of every description in connection with its work. The Contractor shall have charge of the entire work until completion and acceptance, and shall alone be liable and responsible for any injuries to persons and any loss or damage to property, buildings, or adjacent work that may occur as a consequence of or during the progress of the work under this Contract, whether such damage or accident be due to the Contractor's own negligence or that of its servants, agents, employees, or whether such damage or accident be due to the inherent nature of the work, or whether such damage or accident be due to other causes.

28. **Indemnification.** The Contractor shall indemnify, defend and hold harmless the City, its officers, employees, and agents, from and against any and all losses, costs and expenses, including but not limited to litigation costs, settlement fees and expenses, and counsel fees and expenses, claims, suits, actions, damages, liability and expenses, arising out of or resulting in whole or in part from the performance of the work under the Contract, including, but not limited to, those in connection with loss of life, bodily injury, personal injury, damage to property, contamination or adverse effects on the environment, intentional acts, failure to maintain a drug-free work site and workforce and any other breach of the Contract, regardless of the inherent nature of the work and regardless of whether or not such loss, cost, claim, suit, action, damage, liability, or expense is caused in whole or in part by the negligent act or omission of a party indemnified hereunder. Such obligation shall not be construed to negate, abridge or reduce other rights or obligations of indemnity which would otherwise exist as to a Party or Person described in this Paragraph. The Contractor shall further indemnify, defend and hold harmless the City from and against any and all claims, demands, liens, causes of action, liabilities and judgments of any kind asserted against the City by any Subcontractor or suppliers on account of or relating to the furnishing of services, work, labor, materials or equipment under the Contract for the Contractor.

In claims against any Person indemnified under this Paragraph 28 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Paragraph 28 shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers compensation acts, disability benefit acts or other employee benefit acts.

29. **Assignment.** Except through a Subcontract, the Contractor shall not assign the Contract, or any part of the Contract, or delegate performance of the Contract (other than to its own work forces), without obtaining the prior written consent of the Procurement Commissioner and Operating Commissioner. The decision whether to consent to an assignment, the timing of consent (if any), and conditions to such consent, if any, shall each be at the City's sole discretion. Any consent to the assignment of any monies to be paid under the Contract shall not relieve the Contractor from the faithful performance of any of its obligations under the Contract or change any of the terms and conditions of the Contract. Any purported assignment in violation of this provision shall be void and of no effect. The City's consent to an assignment shall not release the assignor from any liability accrued or thereafter accruing under the Contract. Any assignment or purported assignment shall be in writing and shall contain an express assumption by the assignee of all liability accrued or thereafter accruing under the Contract. Consent by the City to any assignment shall not be deemed a course of conduct, dealing or performance with respect to any other assignment or proposed assignment. For purposes of this Paragraph 29, an assignment includes the transfer or acquisition of the Seller or the Contractor, or a controlling interest therein, through a corporate or other merger, and the appointment of a receiver or bankruptcy trustee, and the transfer of the Contract or the Contractor in any bankruptcy or other insolvency proceeding.

30. **Insurance.** Unless otherwise approved by the City's Risk Manager in writing, the Contractor shall, at its sole cost and expense, procure and maintain, or cause to be procured and maintained, in full force and effect until the Contractor completes the work under the Contract, the types and minimum limits of insurance specified below, covering the Contractor's performance of the work required under the Contract. The Contractor shall procure, or cause to be procured, all insurance from reputable insurers admitted to do business on a direct basis in the Commonwealth or otherwise acceptable to the City. All insurance herein, except Professional Liability insurance, shall be written on an "occurrence" basis and not a "claims-made" basis. In no event shall the Contractor perform any work under the Contract until the Contractor has delivered or caused to be delivered to the City's Office of Risk Management the required evidence of insurance coverages. If the Contractor fails to obtain or maintain the required insurance, the City shall have the right to treat such failure as a default under

the Contract and to exercise all appropriate rights and remedies. All insurance coverages shall provide for at least thirty (30) days prior written notice to be given to the City in the event coverage is materially changed, cancelled, or non-renewed. The City, its officers, employees, and agents, shall be named as additional insureds on the General Liability Insurance policy and, where applicable, the Builders Risk Insurance Policy. The Contractor shall also deliver or cause to be delivered to the City an endorsement stating that the coverage afforded the City and its officers, employees and agents, as additional insureds, will be primary to any other coverage available to them and that no act or omission of the City, its officers, employees or agents shall invalidate the coverage.

a. Workers' Compensation and Employers' Liability.

1. Workers' Compensation: Statutory limits
2. Employers' Liability: \$100,000 Each Accident – Bodily Injury by Accident; \$100,000 Each Employee – Bodily Injury by Disease; and \$500,000 Policy Limit – Bodily Injury by Disease.
3. Other states insurance including Pennsylvania.

b. Commercial General Liability Insurance.

1. Limit of liability: \$1,000,000 per occurrence combined single limit for bodily injury (including death) and property damage liability; \$1,000,000 advertising injury; \$2,000,000 general aggregate, and \$1,000,000 aggregate for products and completed operations. The City may require higher limits of liability if, in the City's sole discretion, the potential risk warrants.
2. Coverage: Premises operations; Blanket Contractual liability; Personal injury liability; Products and completed operations; Independent Contractors; Employees and volunteers as additional insureds; Cross liability; Broad form property damage (including completed operations); Explosion, collapse and underground hazards; and asbestos abatement liability Coverage (Note: Required for asbestos abatement projects only).

c. Automobile Liability.

1. Limit of Liability: \$1,000,000 per occurrence combined single limit for bodily injury (including death) and property damage liability.
2. Coverage: Owned, non-owned and hired vehicles.

d. Builders' Risk/Installation Floater Insurance.

1. When required: This insurance is required only when the total Contract price is \$500,000 or greater (Note: not for road and street work, unless required in the Supplementary Conditions, Technical Specifications, Standard Details and Specifications, and/or General Bidding and Contract Requirements).
2. Coverage: "All risks" in an amount equal to not less than the full replacement cost of the work under the Contract (meaning work in replacement which is of like kind and quality).
3. Period of Coverage: Anything herein to the contrary notwithstanding, the Builders' Risk Insurance shall be procured and maintained during the entire period of performance of the Contract until final acceptance of the work by the City.



Certificates of insurance evidencing the required coverages and additional insured endorsements must specifically reference the City contract Number for which they are being submitted. The original certificates of insurance shall be submitted to the Department and the Office of Risk Management at least ten (10) days before work is to commence and at least ten (10) days before each renewal date. The ten (10) day requirement for advance documentation of insurance coverage may be waived in situations where such waiver will benefit the City, but under no circumstances shall the Contractor actually begin work (or continue work, in the case of renewal) without providing the required proof of insurance and required endorsements. The City reserves the right to require the Contractor to furnish certified copies of the original policies of all insurance required under this Contract, including certified copies of all required endorsements, at any time upon ten (10) days prior written notice to the Contractor.

**31. Proprietary Rights Indemnity.** The Contractor shall indemnify, defend and hold harmless the City, and its officers, employees, and agents, from and against any and all losses, costs and expenses, including, but not limited to, litigation costs, settlement fees and expenses, and counsel fees and expenses, claims, suits, actions, damages, liability and expenses for or on account of the use of patented appliances, products, processes, constructions, designs, or methods, or the infringement of any patent, trademark, service mark, copyright, or trade secret rights of any third party, and the Contractor shall pay all royalties, charges and penalties which may become due or payable by reason of such use or infringement. Before the issuance of the Final Estimate, upon request by the Project Manager, the Operating Commissioner, or the Procurement Commissioner, the Contractor shall submit evidence of the full payment of such royalties, charges and penalties, or in lieu thereof, Contractor shall give such security, approved by the City Solicitor, as may in the opinion of the Project Manager, the Operating Commissioner, or the Procurement Commissioner, be necessary to indemnify, defend and hold harmless the City, its officers, employees, and agents, as aforesaid.

**32. Default and Remedies.**

a. It shall be a violation of the Contract for the Contractor to abandon the work under the Contract; to fail or refuse to prosecute the work with promptness and diligence; to unreasonably delay the work so that it may not be completed within the contract time; to fail or refuse to proceed with work under a Disputed Change Order; to fail or refuse to furnish suitable materials in place of any which may be rejected by the Project Manager as unsuitable as not being in accordance with the Contract Documents, or to refuse or neglect to furnish and supply a sufficient number of properly skilled workers and necessary equipment or either of them; to execute any of the work improperly, carelessly, or in bad faith; to fail or refuse to remove any of the work which, in the opinion of the Project Manager, is defective and unsuitable and not in accordance with the Contract Documents, and to replace it with work that is in accordance with the Contract Documents; to cause or permit to occur an Event of Insolvency with respect to the Contractor; or to otherwise violate any of the terms, conditions, and provisions of the Contract. In the event of a violation of Contract, the Operating Commissioner may notify the Contractor and its surety in writing to require that each remedy the Contractor's violation of the Contract and require the Contractor to comply with the terms, conditions, and provisions of the Contract which it has violated or is violating. The failure of the City to promptly notify the Contractor of a violation of Contract shall not constitute an acceptance by the City of work which is performed or installed in violation of the Contract.

b. If the Contractor shall fail to cure or remedy, or diligently commence to cure or remedy, the violation of the Contract, as described in the notice specified above, within five (5) days after the receipt of said notice, or within twenty four (24) hours after receipt of said notice when, in the opinion of the Operating Commissioner, immediate action is necessary to safeguard life or property, or within some other period of time specified in the notice, the Operating Commissioner shall thereupon notify the Procurement Commissioner, who shall have the right to declare the Contractor in default of the Contract, and to notify the Contractor to discontinue the work or any part thereof under the Contract, and to call upon the surety to carry out its obligations under the performance bond posted for the Contract.

c. If the surety fails to abide by the terms of the performance bond or if the surety shall deny liability to the City under the performance bond, the Procurement Commissioner shall have the right to declare the surety in default under the performance bond and, at his or her sole option, shall also have the right:

1. To terminate the work under the Contract, to maintain conditions, to obtain Quotes (if circumstances will allow) for all or any portion of the work, and to enter into a new contract to complete the work of the original Contract; or

2. In case of an emergency, including, but not limited to, danger to life or property, or serious interference with traffic, to terminate any and all of the work under the Contract, and to then and there secure in the open market, from any Person, at the then current market prices the materials of the quality and quantity required, the necessary workers and mechanics, and the required equipment to complete the Contract.

d. Upon default by the Contractor as herein set forth, all moneys due and owing to the Contractor upon estimates, retainage, or otherwise, materials delivered, materials built into the work, and the Contractor's plant (including tools, appliances, and equipment on the premises intended for use in the performance of the Contract), shall become the property of the City for use in the completion of the work under the Contract, and the City shall have resort thereto to the extent necessary to maintain and complete the work and reimburse the City for its outlays and expenditures.

e. In case of such default by the Contractor the remedies herein provided shall be in addition to and not in substitution of the rights and remedies which would otherwise be vested in the City by statute, at law or in equity, all of which rights and remedies are specifically reserved to the City. In addition, upon default by the Contractor, the Procurement Commissioner shall have the right to secure from any Person the materials, equipment, and labor necessary and required for the proper completion of the Contract. In such event, the Contractor shall pay the City, upon demand, the difference between the cost paid by the City for such materials, equipment and labor and the price or prices set forth in the Contract, together with all costs and expenses incident to the same and incurred by the City. Upon default by the Contractor, the Procurement Commissioner, in his or her sole discretion, shall also have the right, to terminate the Contract and to secure from any Person the materials, equipment, and labor necessary and required for the proper completion of the work. In such event, the Contractor shall pay the City, upon demand, the difference between the price or prices set forth in the Contract and the price or prices which may be paid upon such termination and completion of the work, together with all costs and expenses incident to such re-advertisement. In the exercise of either of these remedies, the City shall further have the right to a set-off against any monies which may be due or may thereafter become due the Contractor under the Contract or any other contract between the City and the Contractor. If the Procurement Commissioner shall secure materials, equipment, and labor to complete the work under the Contract, or if the Procurement Commissioner shall terminate this Contract, the Procurement Commissioner shall have the right to take possession, for the purpose of completing the work under the Contract, of all materials, tools, appliances, and equipment on the Project site, intended for use in the performance of the Contract. The Contractor hereby assigns to the City (and each Subcontract shall require each Subcontractor to assign) all right, title, and interest of the Contractor in and to such materials, tools, appliances, and equipment. The failure of the City to exercise any of the remedies herein provided shall not preclude the resort by the City to any other remedy available to the City arising out of the Contractor's default.

f. The use of any specific remedy herein provided shall not bar subsequent or concurrent resort to any other remedy available to the City at law or in equity, for the recovery of damages or otherwise, on account of such default, or in the event of any other default by the Contractor.

g. The Contractor and its surety shall pay to the City on demand, all loss, expense, cost or damage suffered or incurred by the City by reason of any default.

**33. Subcontracts.** Within fifteen (15) days after execution of the Contract, the Contractor shall submit in writing to the Project Manager the names of all Subcontractors who will perform any work on the Contract or who will supply any materials or equipment for the Contract. All proposed Subcontractors who have not been pre-approved by the Department may be approved by the Project Manager if in his or her opinion such proposed Subcontractor is reliable, Responsible and competent to perform the work in compliance with the Contract Documents. The City, acting in its sole discretion, reserves the right to reject any Subcontractor. The City shall have no liability to the Contractor for additional compensation under the Contract, or otherwise, in connection with the substitution of a Subcontractor for any proposed subcontractor rejected by the City pursuant to this Paragraph 33. The Contractor shall be as fully responsible to the City for the acts and omissions of its

Subcontractors and Persons either directly or indirectly employed by them, as it is for the acts and omissions of the Contractor and Persons directly or indirectly employed by the Contractor. The City and the Contractor specifically understand and intend, and acknowledge and agree that no Subcontractor utilized by the Contractor shall have any right or claim against the City or the Department to any monies due and owing to the Contractor for the performance of work under the Contract. Each Subcontract for any portion of the work is hereby assigned to the City provided that (a) such assignment is effective only after termination of the Contract by the City and only for a Subcontract which the City, acting in its sole discretion, accepts by issuing notice to such Subcontractor and to the Contractor; and (b) such assignment, if exercised, is subject to the prior rights of the surety, if any, obligated under a bond relating to this Contract. The exercise of the foregoing option for an assignment shall be in the City's sole discretion, the City having no duty or obligation to the Contractor, such Subcontractor or any surety, to exercise or decline to exercise the foregoing option for an assignment. The Contractor shall incorporate the foregoing option for an assignment into each Subcontract for any portion of the work.

**34. Permits and Licenses.** Unless otherwise noted elsewhere, the Contractor shall obtain all permits and licenses required by the City or pursuant to Applicable Law in connection with the performance of all or any part of the work under the Contract, unless otherwise specifically directed. The Contractor will be required to pay the current fee for such permits and licenses required in connection with all or any portion of the work under the Contract, including any permits and licenses required in connection with any equipment, system or component forming part of the work.

**35. Co-operation and Coordination with other Contractors.**

a. The Contractor shall have the duty to co-operate and coordinate with any other contractors on other work which is being performed concurrently on or adjacent to the Project site, including specifically PGW, or its contractors or any other non-City utilities or authorities, and shall afford reasonable facilities and access to them. The Project Manager will decide any matters in dispute as to the performance of the work, including access to the Project site and priority of performance on either side of any division line between contiguous sections of the Project site where the Contractor and another contractor each work.

b. Where the work or any portion thereof is performed by the Contractor as part of a "multiple-prime" project, or in conjunction or combination with other "prime" contractors, the Contractor shall have the duty to cooperate and coordinate its work with the work of each of the other prime contractors. The Contractor shall further have a duty not to delay, disrupt, interfere with, or otherwise retard the progress of the work of any of the other prime contractors.

c. It is expressly understood by the Contractor that, on "multiple-prime" projects, the City relies primarily, but not exclusively, upon the organization, management, skill, cooperation and efficiency of the "Contractor for general construction" (unless a different Contractor is otherwise designated in the General Bidding and Contract Requirements or the Technical Specifications) to oversee, coordinate, and plan the work of all the other prime contractors, including, but not limited to, the prime contractors for electrical, mechanical, HVAC, and plumbing work, so as to complete the work under all of the prime contracts in a timely and efficient manner. The Contractor therefore expressly recognizes that the "Contractor for general construction" shall be the coordinating Contractor for all aspects of the multiple-prime contract work, including the scheduling of all such work. The Contractor shall have an explicit duty on "multiple-prime" projects to rely primarily upon the organization, management, skill, cooperation and efficiency of the "Contractor for general construction" to oversee, coordinate, and plan its work with the work of all of the other prime contractors, so as to ensure completion of the work under all of the contracts, including the Contract, in a timely and efficient manner and without disruption and interference. It is expressly understood by the Contractor, however, that the City is also relying upon the organization, management, skill, cooperation and efficiency of the Contractor so as to ensure completion of the work under the Contract in a timely and efficient manner and without disruption and interference.

d. It is expressly understood by the Contractor that time is of the essence of this Contract. The Contractor agrees to diligently prosecute its work in coordination and cooperation with the work of the other prime contractors and under the coordination of the "Contractor for general construction," without delay,

interference, or disruption, so as to ensure the completion of the Contract work in a timely and efficient manner and in conformity with the schedule approved by the City under the Contract. In the event that the Contractor shall unnecessarily delay, disrupt, or interfere with the work of any of the other prime contractors, the Contractor shall be liable for the payment of all costs and expenses incurred by such prime contractor or prime contractors on account of such delay, disruption, or interference. The Contractor accordingly authorizes the City to deduct the amount of such costs and expenses from any monies due and owing to the Contractor under the Contract. The Contractor shall further assume all liability, financial or otherwise, in connection with its Contract and shall protect, defend, and hold harmless the City from and against any and all damages or claims that may arise because of inconvenience, delay, interference, disruption, or loss experienced by the Contractor because of the presence and operations of other prime contractors working within the limits of the same multiple-prime project.

e. The provisions of this Paragraph 35 shall be read in conjunction with any provisions in the Technical Specifications, the Proposal, and the Plans, and, notwithstanding Paragraph 95 of these Standard Contract Requirements, the provisions of this Paragraph 35 shall take precedence over any other provisions in the Technical Specifications respecting the "coordination and cooperation" among prime contractors on a "multiple-prime" project, except where such other provisions shall impose greater duties upon the Contractor for coordination and cooperation.

**36. Clean-up of Project Site.** The Contractor and its Subcontractors shall remove all rubbish or refuse and all unused materials and tools from the Project site daily, if required by the Project Manager, and as the work progresses the Contractor shall carefully clean and keep the Project site clean from such rubbish and refuse. The Contractor shall furnish to the Project Manager upon request all documentation regarding the proper disposal of all rubbish, soil, refuse, and other debris. Before the City will approve the completion of the work under the Contract, the Project site and any other place or places affected by the work shall be thoroughly cleared of all construction and other debris and dust, and left clean, free from debris, construction plant, buildings, and materials; fit for travel or other proper use; and in as good condition as existed before the work was begun. The Contractor shall resod or plant anew any grass plot or plots disturbed, and replace any shrubbery destroyed. Structures shall be broom clean, free from stains, spots or other blemishes, and ready for use, and all glass shall be washed. The clean-up work shall be governed by the record of existing conditions made and filed with the Department prior to the commencement of work.

**37. Maintenance after Completion and Contractor's Guarantee.**

a. The Contractor shall guarantee the work of the Contract against defects in materials and workmanship for a period of one (1) year from the date of completion and acceptance of the work by the City, unless a longer period is specified, and shall guarantee and warrant that all equipment shall perform in accordance with the specifications of the manufacturer and in accordance with the Technical Specifications. When individual items of the Contract, including equipment, are formally accepted in writing by the Project Manager and used or operated by the City prior to the completion of the total work under the Contract, the period of guarantee for such items shall be calculated from the date of final written acceptance of such items, provided, however, that the item of work and equipment is used or operated by the City for a period of ninety (90) consecutive days following the date of acceptance without the occurrence of any defects, breakdowns, or faulty operation. Paving, including curbs and footway, shall be similarly guaranteed for a period of five (5) years from the date of completion and acceptance of the work by the City.

b. If, within such one (1) year or five (5) year period of guarantee, any of the work shall prove to be defective either in materials or workmanship, or if damage occurs by settlement of the backfill placed under this Contract, or if any part or parts of any equipment furnished shall prove to be inadequate, insufficient, or defective, either in design, materials, or workmanship, the Contractor shall immediately, upon demand of the Project Manager (whose decision as to such inadequacy, insufficiency, or defectiveness shall be binding and conclusive upon the Parties hereto), repair and replace the same in accordance with the Plans and Technical Specifications, and shall repair and replace any damage to other parts or structures at the Contractor's sole cost and expense, without cost or expense to the City, to the approval and satisfaction of the Project Manager.

c. Should the Contractor or its sureties fail to comply with the orders of the Project Manager to replace or repair defective materials, workmanship, or equipment as aforesaid within the time specified in

subparagraph (a) above, the Operating Commissioner shall notify the Procurement Commissioner, who shall have the right to declare the Contractor or its surety, or both, in default and to proceed with the correction of the defect in accordance with the methods provided herein.

**38. Access to Accounting Records.** The Contractor shall certify that all materials, equipment, and labor charged to the City are accounted for and shall keep such full and detailed accounts as may be necessary for proper financial management under this Contract. The Contractor shall retain, and shall provide the City and its representatives access to, all records, books of account, correspondence, instructions, Shop Drawings, receipts, vouchers, memoranda, and similar data and documentation pertaining to the Contract for a period of five (5) years following final payment, or earlier termination of the Contract, or for such longer period as may be required by law; however, if any litigation, claim or audit is commenced prior to expiration of said five (5) year period, then the records shall be retained until all litigation, claims or audit findings have been completely terminated or resolved, without right of further appeal, or if Applicable Law requires a longer period, then the records shall be retained for such longer period. From time to time during the performance of the work under the Contract, and for a period of five (5) years after the completion of the work under the Contract, the City may audit any and all aspects of the Contractor's performance under the Contract, including but not limited to its billings and invoices. Representatives, agents or contractors of the City, including the Department, or other authorized City representatives including, without limitation, the City Controller may conduct audits. If requested by the City, the Contractor shall submit to the City all vouchers or invoices presented for payment pursuant to the Contract, all cancelled checks, work papers, books, records and accounts upon which the vouchers or invoices are based, and any and all documentation and justification in support of expenditures or fees incurred pursuant to the Contract. All books, invoices, vouchers, records, reports, cancelled checks and other materials shall be subject to periodic review or audit by the City. All work, equipment, materials, systems, subassemblies, tools appliances and plant shall be subject to inspection and review by City, federal and state representatives, as may be applicable, or their designees, at the offices of the Contractor in the City, or in another location with the City's consent. The Contractor shall cooperate with all City, state and federal inspections and reviews conducted in accordance with the provisions of the Contract. Such inspection and review of the Contractor's work hereunder shall be in the sole discretion of the inspecting or reviewing entity. Such inspection or review may include, without limitation, review of staffing ratios and job descriptions, and meetings with any of the Contractor's staff who are either directly or indirectly involved in providing all or any portion of the work hereunder. The Contractor shall make available, within the City at reasonable times during the performance of the work hereunder and for the period set forth above in this Paragraph 38, all records pertaining to the Contract for the purpose of inspection, audit or reproduction by any authorized representative (including any agent or contractor and the City Controller) of the City, the Commonwealth Auditor General, and any other federal or state auditors, as may be applicable, at no additional cost to the City.

**39. Sales and Use Tax; Federal Excise Tax.**

a. The City is not subject to federal, state or local sales or use tax or federal excise tax. Contractor hereby assigns to City all of its right, title and interest in any sales or use tax which may be refunded as a result or the purchase of any materials in connection with the Contract, and the Contractor, unless directed by the City, shall not file a claim for any sales or use tax refund subject to this assignment. The Contractor authorizes the City, or its agent, in its own name or in the name of the Contractor, to file a claim for a refund of any sales or use tax subject to this assignment. To the extent it may be applicable to the work under this Contract, the Contractor covenants and agrees that it shall not bill the City for or otherwise pass-through to the City for payment any Federal Excise Tax paid in connection with the work under this Contract; in consideration of the Contractor's foregoing covenant, the City hereby consents to any filing by the Contractor for a refund of any Federal Excise Tax paid in connection with the work under this Contract.

b. The Contractor agrees to include the above referenced Paragraph in any Subcontracts with Subcontractors.

**D. ADMINISTRATION, MEASUREMENT, AND PAYMENT**

**40. Status and Authority of the Project Manager.** The Project Manager shall be responsible for the general direction of the work to be performed under the Contract, the interpretation of the Plans and General Bidding and Contract Requirements, and the Technical Specifications, the ordering of additions to or deductions from the work, and the determination of procedure. The Project Manager shall give all orders and directions contemplated under the Contract. The Project Manager shall in all cases determine the amount, quality, acceptability, and fitness of the several kinds of work and materials which are to be paid for under the Contract, and shall have authority and sole discretion to reject all work and materials which in his or her opinion do not conform to the requirements of the Contract. The Project Manager shall determine all other questions that may arise in relation to the execution of the work and shall have the authority to halt the work whenever such action may be necessary to secure the safe and proper execution of the Contract. The Project Manager shall adjust and decide any differences or conflicts that may arise between the Contractor and other prime contractors for the performance of concurrent work. The provisions of this Paragraph are not intended to supersede or limit the provisions of Paragraph 35.

**41. Plans and Technical Specifications.** The Plans, with all notes thereon, and the Technical Specifications are intended to be consistent with one another and of equal force and effect, and in the event the Contractor should believe that an apparent discrepancy may exist between the Plans and the Technical Specifications, the Contractor shall bring such apparent discrepancy to the attention of the Project Manager, who will interpret their meaning. The Plans give general dimensions and sizes, and such details as are required to cover special features. Figures shall have preference over scale in reading dimensions. The Contractor shall maintain at the site of the work for use of the Project Manager or Inspector one record copy of the Plans and Technical Specifications, and Change Orders and other Contract modifications, and one record copy of all approved Shop Drawings and other submittals, including the construction schedule.

**42. Shop Drawings and Working Drawings.** The Contractor shall prepare and submit to the Department or the Project Manager, as specified in the Technical Specifications or as required by the Project Manager, all Shop Drawings and Working Drawings, which shall include all details required to carry out the City's Plans and Technical Specifications. By approving and preparing Shop Drawings and other similar submittals, the Contractor represents that it has determined and verified materials, field measurements, and field construction criteria related thereto and has checked and coordinated the information contained within such Shop Drawings and submittals with the requirements of the Contract Documents. The Contractor shall not proceed with any portion of the work until the Shop Drawings or other submittal which governs the work has been approved. The Shop or Working Drawings shall conform to standards specified by the Department. Upon correction, if found necessary, and after approval, the Contractor shall furnish three (3) or more prints of the Shop Drawings or Working Drawings for construction purposes. After the completion of the work, the documents shall be delivered to and become the sole property of the City for its unrestricted use. The approval of Shop Drawings shall not relieve the Contractor of responsibility for the proper fit of the work, nor for its completion pursuant the Contract.

**43. Lines and Grades – City Datum.** Vertical dimensions are given in United States standard feet and fractions thereof. Unless otherwise stated, elevations preceded by a plus (+) or a minus (-) sign refer respectively to distances above or below the established City Datum, which is two and one quarter (2.25) feet above mean high water in the Delaware River at Chestnut Street, Philadelphia. Dimensions locating buildings and structures shall be verified and checked in the field by the Contractor before proceeding with construction details affected thereby. Curb line and paving stakes giving the requisite basic data will be set by the City. The price for the setting of these lines shall be at the predetermined rate as set by the Board of Surveyors and made part of the public record or as stated in the Contract Documents. The Contractor will be held responsible for the proper and correct extensions of measurements from such data, and the correctness of work based thereon. The Contractor will be held responsible for the preservation of stakes, benchmarks, and survey monuments, until authorized to remove them. Should any stakes be disturbed, the cost of replacing them will be charged against the Contractor at the then current fee as determined by the City's district surveyor and regulator, to be deducted from the Final Estimate. All survey monuments or benchmarks moved, covered or uprooted in the course of performance of the work of this Contract will be reset by the City at the expense of the Contractor, at the then current fee per monument or benchmark, as determined by the City's district surveyor and regulator. Said cost shall be deducted

from the Final Estimate. The Contractor shall provide reasonable and necessary opportunities and facilities for setting points and taking measurements. The Contractor shall not proceed until it has made timely demand upon the District surveyor and regulator for, and has received from him or her, such points and from the resident engineer such instructions as may be necessary for the progress of the work. Any work improperly done without lines or levels or instructions shall be removed and replaced by the Contractor at its own expense. Failure to do so may be considered a default under the Contract.

**44. Contract Amount.** The total amount which is to be paid by the City to the Contractor for the work performed and materials supplied under the Contract shall in no event exceed the sum of the Contractor's Quote price, plus a contingency fund of approximately ten percent (10%) of the Contractor's Quote price (to be specified by the Procurement Department upon the award of the Contract), which fund is intended to cover additional compensation which may be due to the Contractor as a result of Change Orders issued pursuant to Paragraphs 48 and 49 below, as such sum may be increased or reduced pursuant to a Change Order or Change Orders, or pursuant to an Amendment. The City shall specify the contract amount in the Notice of Contract Award. The Contractor acknowledges that the City's liability under the Contract shall be limited by the amounts which shall have been or may be from time to time appropriated by City Council. The City reserves the right to authorize the Contractor to commence work prior to appropriation of the total amount of the Contract, in which case the City shall give the Contractor notice thereof, and the City shall not be liable hereunder in any amount greater than that appropriated therefor by City Council. Payments will only be made payable to the Contractor as shown on the purchase order; the invoice must reflect this same Contractor name as the entity to "pay to". For any bids awarded for work to begin on or after July 1, 2019, the City has instituted a policy of making all of its payments through electronic deposits into the awarded Contractor's designated bank account. Before any City payments are made, the Contractor will be required to supply the City with the information necessary for the City to initiate electronic payments by completing one of the electronic payment processing enrollment forms available on the City's vendor portal at <https://secure.phila.gov/finance/vendorpayments>. Applicants awarded a contract before July 1, 2019 are encouraged to complete one of the electronic payment processing enrollment forms before the conversion to electronic payments becomes mandatory. The City intends to stop issuing paper checks. The foregoing notwithstanding, nothing herein shall be construed to limit the City's ability to make payments by assessment bills as provided in paragraph 57, below.

**45. Scope of Payments.** Payment for the cost of all work, labor, materials, and services required to complete the work of the Contract as shown in the Plans, Technical Specifications, Standard Details and Specifications, or as otherwise specified (except where payment is otherwise specifically provided), will be made at the unit prices or lump sum prices contained in the Quote. The prices contained in the Quote shall each cover the supply and installation, in a good, sound, substantial and workmanlike manner, of everything required for and incidental to the full completion of the work of that item as called for by the Plans, Technical Specifications, Standard Details and Specifications, or as otherwise specified, including its proportionate share of the expense of all plants, tools, and equipment required; the cost of all bonds, fees, and permits; of all administration, superintendence, and insurance; and of any loss or damages arising out of the nature of the work, from the action of the elements, from any unforeseen difficulties encountered in the prosecution of the work, and from risks of all kinds connected with the work, except as otherwise specifically provided in the Contract Documents.

**46. Quantities are Approximate.** When quantities of the various classes or components of work and materials required under the Contract are stated in the Bid Solicitation or elsewhere, such quantities are estimated and approximate, except where otherwise stated to the contrary. When stated in the Bid Solicitation or a Seller's Proposal, they are given only for the purpose of comparing the Quotes on a uniform basis. The City does not guarantee that such estimated quantities will correspond to the actual quantities ultimately required to complete the work, and the City will not allow any claim for damages, for anticipated profit, or for loss of profit of the Contractor in the event that actual quantities used to complete the work under the Contract vary from the estimates in the Bid Solicitation. The Department reserves the right to increase or decrease the quantities or to entirely omit any of the items as contained in the Bid Solicitation to the extent found necessary by the Project Manager, provided that the aggregate cost of the work performed is within the limit of funds fixed in the Contract.

**47. Changes.**

a. If changes to any portion of the work or the requirements of the Plans, Technical Specifications or Standard Details and Specifications are deemed necessary by the Project Manager, in order to carry out and complete the work covered by the Contract Documents, the Project Manager may by notice to the Contractor order alterations to or changes in the work covered by the Contract Documents, and the Contractor shall promptly comply with such orders. No changes or alterations to the work shall be made or performed by the Contractor except upon prior written orders from the Project Manager authorizing the change and a Change Order fixing the additional compensation or deduction therefor, except where the order authorizing the change states that the method of compensation or deduction shall be determined at a later date.

b. Where the Project Manager pursuant to Paragraph 47(a) orders additions to or deductions from the amount of work called for by the Plans or Technical Specifications, or where changes are ordered in writing in the design of the work or the requirements of the Plans or Technical Specifications which increase or reduce the cost of the work to the Contractor, adjustment in compensation therefor shall be made to cover the additional work required or the work reduced, in accordance with a written order of the Project Manager, as follows:

1. For work for which applicable unit prices are bid in the Bid Solicitation, payment or deduction shall be made in accordance with the prices bid. When the final quantity of work performed on a unit price bid item differs substantially (twenty-five percent (25%) or more) from the Bid Solicitation quantity, the Project Manager will review the price contained in the Quote and the actual work performed by the Contractor and may, in his or her sole discretion, determine if an adjustment is appropriate. Where the Project Manager deems an adjustment appropriate, the Contractor shall:

i. substantiate that the Quote unit price remains fair and reasonable despite the substantial change in quantity; or

ii. in the case of substantial underrun compared to the previously estimated quantity, negotiate a revised unit price for all the work actually completed; or

iii. in the case of substantial overage compared to the previously estimated quantity, negotiate a revised unit price for that portion of the actual work completed in excess of one hundred twenty-five (125%) of the Quote quantity.

This provision shall not be deemed, however, to vest in the Contractor any rights to any adjustment.

2. For work not covered by the unit prices contained in the Quote, payment or deduction shall be made at the applicable contingent prices named for work.

3. For work for which neither the unit prices bid nor the prices for contingent work are applicable, payment or deduction shall be made in accordance with Paragraphs 48 and 49 below.

#### **48. Change Orders by Agreement.**

a. If alterations or changes increase the cost of the work to the Contractor, additional compensation will be allowed by the City, based upon unit prices, contingent prices, or by a detailed cost proposal submitted by the Contractor to the Project Manager, negotiated by the Department and agreed to by the Contractor, or by Force Account, in accordance with Paragraph 51 below. The cost proposal shall detail the costs of materials, labor, overhead and profit, as well as any proposed changes to the Contract time. If such alterations or changes reduce the cost of the work to the Contractor, the amount of such reduction may be deducted by the City, and any such reduction may be based upon unit prices contained in the Quote for the performance of the deleted items of work, upon any Subcontract already entered into by the Contractor for the performance of the deleted item of work, or upon a detailed cost proposal submitted by the Contractor to the Project Manager and negotiated by the Department. Credit Change Orders will include the same mark-ups as chargeable Change Orders. The Contractor shall submit its cost proposal for the change or alteration within twenty (20) days after the Project Manager gives notification to the Contractor of the intended change or



alteration. Thereafter, a formal Change Order will be executed and signed by the Department reflecting the change or alteration and the additional cost or reduction negotiated by both Parties.

b. A Change Order negotiated and agreed to by the Contractor and the City and then executed as a Change Order by the City and the Contractor shall be deemed to cover all of the Contractor's costs associated with the change or alteration to the work, as reflected in the Change Order, including all costs and expenses incurred by the Contractor for time, material, labor, and extended or field office or home office overhead. Any Contract time extension granted by the City for the Change Order shall be the sole time extension granted for the change or alteration and for which Contractor is entitled, and no other time extension shall be granted by the City in connection with the work reflected in such Change Order. No loss of profit on account of any changes or alterations to the work or on account of work not executed or performed by the Contractor will be allowed, except that the Contractor may be entitled to an extension of time on account of changes or alterations to the work, provided that the Contractor satisfies the requirements of Paragraph 25 above.

c. The Contractor agrees and acknowledges that after a Change Order is negotiated and agreed to by the Parties and then executed by the City, the Change Order shall operate as a full and complete waiver and release of any and all claims of the Contractor related to or arising out of such change or alteration, whether such change or alteration is considered individually or cumulatively, including, but not limited to, any claim by the Contractor for extended home office overhead, extended field office overhead, time-impact costs, schedule delay costs, acceleration costs, compression costs, loss of productivity costs, extra work, additional work, and interference costs, or any combination of such costs.

**49. Disputed Change Orders.** If, after submission of a cost proposal, the Department and the Contractor cannot agree upon a price within a reasonable amount of time, or if the Contractor disputes the applicability of unit prices or contingent prices, the Project Manager may direct the Contractor to perform or complete the extra or additional work notwithstanding that there is no agreement between the Parties as to price, and the Contractor shall proceed to perform the work so as to avoid any delay or interference to the progress of its work. In all such cases, the Contractor shall promptly comply and maintain proper force account time sheets and records, in accordance with Paragraph 51 below. The Project Manager shall also process a Change Order in an amount that he or she determines to be reasonable, necessary and appropriate. If the Contractor does not agree with the amount processed by this Disputed Change Order, the Contractor must notify the Project Manager within ten (10) days of issuance of the Disputed Change Order that it is proceeding under protest and that it reserves the right to a claim for the cost of the disputed work. In all cases of Disputed Change Orders which are protested by the Contractor, the Contractor shall submit to the Project Manager, within five (5) days after completion of the work, a detailed cost proposal which shall detail the costs of materials, labor, overhead and profit, actually expended by the Contractor for the work, as well as any changes to the Contract time.

**50. Disputed Work.** If the Contractor is of the opinion that any work required or ordered by the Project Manager violates the terms and provisions of the Contract or is not called for under the Contract Documents, the Contractor shall promptly notify the Project Manager, in writing, of its contentions with respect thereto and shall request a final determination thereof. If the Project Manager determines that the work in question is work required under the Contract Documents and is not "extra" work, or that the order complained of is proper, the Project Manager will direct the Contractor to proceed with the work in question. In all such cases, the Contractor shall promptly comply and maintain proper force account time sheets and records, in accordance with Paragraph 51 below. In order to preserve its right to claim compensation for such disputed work or damages resulting from compliance with such an order, the Contractor must notify the Project Manager in writing, within five (5) days of receiving notice from the Project Manager of this final determination, that the work is being performed or that the determination and direction is being complied with under protest. Furthermore, in order to claim an adjustment in the Contract price for work performed under protest, the Contractor must submit in writing to the Project Manager, within five (5) days after completion of the work in question, the nature and precise amount of compensation sought for the work, as well as copies of all force account time sheets and records compiled by the Contractor for the work. Failure of the Contractor to so notify the Project Manager of both its protest and its claim for compensation shall be deemed as a full and final release and waiver of any claim for extra compensation or damages therefor.

**51. Force Account.**

a. Payment under Force Account will be for the reasonable, actual and necessary direct cost of the work in accordance with the orders of the Project Manager, and in addition thereto the percentage of such cost hereafter stated. "Reasonable, actual and necessary direct cost" shall be deemed to include the following:

1. Wages of forepersons, equipment operators and skilled and semi-skilled and common laborers directly assigned to the specific operation at actual payroll rate of wages per hour and actual fringe benefits paid, labor taxes as established by law, and workers compensation and employers liability insurance, for each hour that such employees are actually engaged in the performance of the authorized work and, if directed, overtime, as provided by existing laws and regulations, as well as other insurance premium expenses, including but not limited to premiums for general liability insurance, where the such insurance premium expenses are a direct function of the foregoing wages, but only to the extent such insurance premium expenses derive solely from the foregoing wages.

2. The reasonable actual expenditure for materials (including sales tax paid, if applicable, and except as provided to the contrary in Paragraph 39 above), used up or incorporated in the work.

3. For any equipment, including machinery and trucks, mutually deemed as necessary for the performance of the work, the Project Manager shall allow the Contractor reasonable rental rates, computed as follows: (i) for all equipment rented, the Contractor will be reimbursed the reasonable actual costs based upon the receipts provided, plus an allowance for operating cost as provided in subparagraph (ii) of this subparagraph 51(a)(3).; (ii) for all equipment owned, including pumps and compressors, a reasonable hourly rate will be determined by using the reasonable monthly rental rates taken from the current edition (with updated supplements) of the Rental Rate Blue Book for Construction Equipment and dividing it by one hundred seventy-six (176); an allowance may be made for operating costs for each and every hour the machinery or equipment is actually operated in accordance with the rates listed in the aforesaid rental book; if the machinery or equipment is required to be at the work site, but is not operated, the Contractor may be compensated at the reasonable hourly rental rate, exclusive of operating costs. The Contractor will be allowed to add to the above rates the reasonable predominate areas adjustment percentage for the state as shown on the area adjustment map contained in the Rental Rate Blue Book for Construction equipment. In the case of any machinery or equipment not referred to in the Rental Rate Blue Book for Construction Equipment, a monthly rental rate shall be computed on the basis of an amount that is the equivalent of six percent (6%) of the manufacturer's list price for the sale (new) of such equipment; the hourly rate in such cases will be determined by dividing the monthly rate by one hundred sixty (160) when actually operating, and by one hundred seventy-six (176) when at the Project site, but not operating, to which no percentage shall be added. The above rates shall be for the time such equipment is required on the Project site for the performance of force account work exclusively.

b. To the reasonable, actual and necessary direct cost of the work done under Force Account as noted above, twenty percent (20%) will be added to the expenditure for labor and fifteen percent (15%) will be added to the expenditure for materials, excluding sales tax. No additions will be allowed for equipment costs, whether such equipment is rental or Contractor-owned. These percentages shall be deemed to cover the cost of heat, light, bond or bonds, use and up keep of small hand tools, administration, engineering, field and office superintendence, home office and site overhead, extended general conditions, non-payroll taxes, insurance (including general liability and non-payroll insurance), all loss, damage, risk and expenses incidental to the work and profit. The Contractor shall have no claim in excess of the above, such payments being in full compensation for the performance of such work and the furnishing of such materials and for all expense in connection therewith and incidental thereto.

c. Should the Contractor subcontract any portion of the work, with the prior written approval of the Project Manager, payment for that portion will be computed as the reasonable, actual and necessary costs defined above (exclusive of any profit to the Subcontractors), plus the percentages allowed, plus eight percent (8%) mark-up of the total paid to the Subcontractor. No additional percentage mark-up by or for any additional tiers of Subcontractors will be allowed.

d. The Contractor shall submit daily a statement in duplicate of work done on a Force Account

basis within twenty-four (24) hours of the time the work is done, and representatives of the Project Manager and the Contractor shall make daily comparison of the time and rates of labor, material used, etc., as shown therein. After correction, if necessary, this comparison shall be signed by each and filed with the Project Manager and the Contractor. The Contractor shall submit to the Project Manager monthly, prior to each Current Estimate, four (4) copies of an itemized statement of the amount and value of labor and materials furnished, accompanied by the original invoices for work performed under a Subcontract, and by an affidavit certifying the correctness of such statement. The Project Manager shall have access to any books, vouchers, time sheets, records, and memoranda showing the labor employed and the materials actually used on the specific operation and the actual net cost thereof, for the Contractor and any Subcontractor(s). Daily force account time sheets must include the name and job titles of employees, actual starting and quitting times, and the total number of hours worked each day by each employee.

e. Work done under Force Account shall be subject to all of the requirements of the Contract. It shall be prosecuted in an orderly, reasonable and economical way, and the prices paid for labor and material and the method of prosecuting the work shall be subject to the approval of the Project Manager. Neither work nor material will be paid for under Force Account unless it is ordered as such in writing.

**52. Lump Sum Bid Breakdown; Applications for Payment.** In order to assist the Project Manager in estimating approximate quantities and the value of the work performed, the Contractor shall furnish in writing to the Project Manager within thirty (30) days after the issuance of the Notice to Proceed, an apportionment of any lump sum Quote (the "Lump Sum Bid Breakdown") showing in detail its component parts. The Lump Sum Bid Breakdown shall be subject to the approval of the Project Manager. In addition, the Contractor shall furnish within sixty (60) days of the commencement of the work, and thereafter every thirty (30) days until Substantial Completion of the work, an application for payment (the "Application for Payment") which shall set forth in detail the approximate quantities and value of the work performed as of the date of the Application for Payment in conformity with the approved Lump Sum Bid Breakdown. The Contractor shall certify that the information set forth in the Application for Payment is true, correct and complete, and accurately and fairly represents the work performed to date by the Contractor in accordance with the Contract Documents.

**53. Current Estimates.**

a. The Project Manager, after receipt of an Application for Payment, shall prepare a current estimate (the "Current Estimate") of the approximate quantities and value of the work performed at intervals of about one (1) month during the progress of the work, except that the first Current Estimate may be prepared within sixty (60) days of the commencement of work under the Contract, provided at all times, however, that the Contractor is in compliance with all of the requirements of the Contract and the value of the work done during the time covered by the Current Estimate exceeds the amount of fifteen hundred dollars (\$1,500). The City shall make payments to the Contractor on the basis of the Current Estimates, when approved by the Project Manager. The City shall have no obligation to pay interest on the amount due under any Current Estimate, any provision of Applicable Law to the contrary notwithstanding. Payments on uncompleted items will be for the value of work done and materials furnished, as apportioned by the Project Manager. The Current Estimates are approximate only, and subject to correction in the Final Estimate. The payment of a Current Estimate shall not bind the City to the acceptance of any materials furnished or work performed by the Contractor. The City shall not be precluded from later contesting a Current Estimate and shall enjoy every legal defense, or other claim or counter-claim, in recoupment or otherwise, by reason of the character, quality, and quantity of the work and materials covered by a Current Estimate, notwithstanding payment of a Current Estimate.

b. The City may withhold payment for deficient items according to the terms of the Contract. The City shall pay the Contractor according to the provisions of 62 Pa. C.S.A. §§ 3931 et seq., as amended, Subchapter D, Prompt Payment Schedules, for all other items which appear on the Application for Payment and have been satisfactorily completed. If the City withholds payment from the Contractor for a deficient item, it shall notify the Contractor of the deficient item within sixty (60) calendar days of the date that the City received the Application for Payment.

c. Subject to the provisions of subparagraph (e) below, Current Estimates on Contracts which include the furnishing or installing of electrical, mechanical, plumbing, heating, and other equipment, systems or

components especially fabricated as part of the work under the Contract, which are subject to mechanical or electrical test, will include payment of invoice or invoices previously paid by the Contractor, not to exceed ninety percent (90%) of the amount shown on the Lump Sum Bid Breakdown approved by the Project Manager for such equipment, systems or components, when such equipment is delivered to the site, City property, or a bonded warehouse approved by the Project Manager. The City shall pay the balance of ten percent (10%) upon completion of successful testing of such equipment, systems or components, and acceptance thereof by the City. If no invoice is available, the City will pay the Contractor fifty percent (50%) of the cost of such specially fabricated equipment, systems or components, in conformity with the Lump Sum Bid Breakdown when delivered to the site, City property, or a bonded warehouse approved by the Project Manager, and an additional forty percent (40%) when such equipment, systems or components are installed and ready for test. The City shall pay the balance of ten percent (10%) upon completion of successful testing of such equipment, systems or components, and acceptance thereof by the City. The Current Estimates described in this subparagraph shall be reduced by the retainage required under Paragraph 54 below.

d. Subject to the provisions of subparagraph (e) below, Current Estimates may also include, when authorized by the Project Manager, an amount equal to the actual cost of specially fabricated materials and equipment not subject to electrical or mechanical test, furnished but not incorporated into the work, provided that the quantity allowed does not exceed the corresponding quantity estimated in the Contract Documents. The Current Estimates described in this subparagraph shall be reduced by the retainage called for in Paragraph 54 below.

e. Before including payments for equipment and materials described in subparagraphs (c) and (d) above in a Current Estimate, the Project Manager must be satisfied that:

1. the equipment and materials are properly stored, insured and protected through appropriate security measures;

2. paid invoices of suppliers support the Contractor's actual net cost for the equipment and materials;

3. the equipment and materials will be incorporated in the work under this Contract within a reasonable period; and

4. the Contractor assumes full responsibility for the safe storage and protection of the equipment and materials. If the equipment and materials paid for hereunder are damaged, stolen or prove to be unacceptable, the payment made therefor shall be deducted from subsequent estimates and payments unless the equipment and materials are promptly replaced to the satisfaction of the Project Manager and in conformity with the requirements of the Contract Documents. Equipment and materials shall be available for inspection and inventory at the storage site by the Project Manager or his or her authorized representative at all times. Upon payment, title to all such equipment and materials shall be vested in the City, free and clear of any and all debts, claims, liens, mortgages, taxes and encumbrances. The Contractor, at its own expense, shall execute such documents and take such other steps as reasonably required by the City to vest the aforesaid title in the City.

f. The Contractor for itself and any and all Subcontractors acknowledges and agrees that neither the Contractor nor any Subcontractor has any right to file a mechanics', materialman's or other lien against the Project site under the Pennsylvania Mechanics' Lien Law of 1963, Act of August 24, 1963, P.L. 1175, 49 P.S. § 1101 *et seq.*, as amended, or under any other law.

**54. Retainage.** Act 57 of 1998, 62 Pa.C.S. §3921, as amended, shall govern the withholding of retainage on the Contract. Provided that the Contractor is making satisfactory progress and is in compliance with all of the requirements of the Contract and there is no specific legal or other basis for the withholding of greater amounts, retainage under the Contract shall be ten percent (10%) of the amounts due the Contractor until fifty percent (50%) of the work under the Contract is completed, at which time one-half (1/2) of the amount then retained shall be returned to the Contractor, and thereafter five percent (5%) of the amounts due the Contractor until substantial completion of the Contract.

**55. Semi-Final Estimate and Punchlist.**

a. Upon substantial completion of the Contract, the Contractor shall submit an Application for Semi-Final Estimate (the "Application for Semi-Final Estimate"), which shall include a request for a semi-final inspection of the work under the Contract. The Project Manager shall make a semi-final inspection within thirty (30) days of the City's receipt of the Application for Semi-Final Estimate and request for inspection. If, based on said inspection, the City determines that the Contractor has Substantially Completed the work under the Contract, the Project Manager shall issue a certificate of Substantial Completion, which shall include the punchlist items required under subparagraph 55(b) below, and the Project Manager shall process the Semi-Final Estimate. The City shall, upon receipt of said Application for Semi-Final Estimate and upon receipt by the City of any guarantee bonds and other written warranties which may be required in accordance with the contract to ensure proper workmanship for a designated period of time, make payment on the Semi-Final Estimate within forty-five (45) days after issuance of the Certificate of Substantial Completion, except as provided in Paragraph 54 above, and less such additional sums as the City may withhold pursuant to this Paragraph 55. The City shall have the same right to withhold payment from the Semi-Final Estimate as is set forth in subparagraph 53(b) above with respect to Current Estimates. The City shall pay interest on the amount due under the Semi-Final Estimate to the extent provided by Applicable Law. Except as provided in Paragraph 54 above, the Semi-Final Estimate shall reduce the retainage withheld by the City to one and one-half (1½) times the amount required to complete any remaining uncompleted items of work, provided that the Contractor has made satisfactory progress towards completion of the Contract and is in compliance with all of the requirements of the Contract and provided there is no legal or other basis for the withholding of a greater amount. The City reserves the right to withhold additional retainage to the extent the same as is permitted under 62 Pa.C.S. § 3921, as amended.

b. Upon preparation of the Semi-Final Estimate, the Project Manager, with the assistance of the Contractor, shall list in detail and in comprehensive fashion the remaining uncompleted items of work, and a reasonable cost of completion for each item on said list, or such other basis for payment thereof as may be provided in the Contract (which ever method may apply pursuant to the Contract), in an official punchlist which shall thereafter be issued in writing to the Contractor. If the Contractor disputes any of the items on the official punchlist, the Contractor must notify the Project Manager in writing, detailing the items in dispute and the nature of its dispute, with all supporting documentation, within five (5) days after receipt of the official punchlist. The Contractor must commence work on the official punchlist within ten (10) Working Days after receipt of the official written punchlist. The Contractor shall thereafter proceed promptly and expeditiously to complete the official punchlist items, and shall give notice to the Project Manager in writing of the date on which the Contractor completes the official punchlist items. The Contractor shall perform and complete all work on the official punchlist at its sole cost and expense and at no additional cost or expense to the City, subject to payment of the Final Estimate under Paragraph 56 below. The Contractor's work in completion of the official punchlist items shall in all respects be governed by the requirements of the Contract Documents.

**56. Final Estimate and Inspection.** The Project Manager shall conduct final inspection of the work, including the completion of all punchlist items, after completion of all punchlist items to the Project Manager's satisfaction and within thirty days (30) of receipt of the Contractor's formal written request for such final inspection and application for Final Estimate (the "Application for Final Estimate") (which request the Contractor shall not make until completion of the punchlist items). After the punchlist inspection, and provided that all the requirements of the Contract Documents have been complied with to the satisfaction of the Project Manager, including completion of all official punchlist items, the Project Manager will prepare a final payment (the "Final Estimate") and, based upon the Final Estimate, the City will pay the balance due to the Contractor, after all allowable additions and deductions have been made, by checks drawn by the City Treasurer or assessment bills as provided in Paragraph 57 below, or a combination of these two methods of payment. The foregoing to the contrary notwithstanding, the City shall have the same right to withhold payment from the Final Estimate as is set forth in subparagraph 53(b) above with respect to Current Estimates.

**57. Assessment Bills.** Where required by ordinance of the City Council of the City, the Contractor shall receive, and accept as payment, assessment bills against abutting property, as compensation for furnishing materials, labor, tools, and equipment, and for doing the work set forth in the Contract Documents. The Contractor shall collect such assessment bills at its own cost, and employ all legal remedies or proceedings, whether by lien, civil action, or otherwise, including recourse to the appellate courts, to which the City may be entitled. The

Contractor acknowledges and understands that the City does not in any way guarantee either the value, or the collection, of any assessment bill or bills, and that in the event of neglect to properly file and collect the assessment bill or bills, no recourse shall be had to the City by reason thereof. The Contractor hereby accepts and assumes all risk of failure to collect any such assessment bill or bills.

**58. Contractor Claims.**

a. Except as otherwise provided in these Standard Contract Requirements, the Contractor must notify the Project Manager in writing of any and all claims whatsoever relating to or arising out of Contractor's performance of the work under the Contract within ten (10) days of the event or occurrence giving rise to the claim, except where a shorter time is specified by the Contract Documents. The written notice of claim to the Project Manager shall provide a detailed statement of and basis for the claim, with supporting documentation attached. For purposes of this Paragraph 58, a "claim" shall mean a demand or assertion by the Contractor seeking, as a matter of right, an adjustment or interpretation of the Contract, payment of money, extension of time or other specific relief with respect to the terms and conditions of the Contract. The Project Manager will review all claims submitted by the Contractor and shall approve or reject each claim in whole or part, or shall request additional documentation in support of the claim from the Contractor.

b. The City and the Contractor hereby release and waive any and all claims against each other for consequential damages arising out of or related to the Contract and the work performed thereunder. This mutual release and waiver includes damages incurred by the Contractor for principal home office expenses, including home office overhead and the compensation of personnel stationed there, for losses of financing, business, and reputation, and for loss of profit associated with any other work, except anticipated profit arising directly from the Contract and the work thereunder. Nothing hereunder shall preclude, however, the assessment by the City of liquidated direct damages, when applicable in accordance with the Technical Specifications, General Bidding and Contract Requirements, and other applicable locations in the Contract Documents, or damages pursuant to Paragraph 25(h) above.

c. After Substantial Completion of the work under the Contract, but prior to the Contractor's acceptance of the Final Estimate, the Contractor shall notify the Project Manager in writing of any and all unresolved and previously asserted claims relating to or arising out of the work. The Contractor's written notice of claims to the Project Manager shall list the claims by number, assign a dollar value to each claim, and provide a detailed statement of each claim, with supporting documentation attached, including a copy of the notice by which the Contractor first brought the claim to the attention of the Project Manager.

d. Failure of the Contractor to notify the Project Manager of any claims in accordance with subparagraphs (a) and (c) above, and the Contractor's acceptance of and negotiation of payment under the Final Estimate under Paragraph 55 above, shall constitute and operate as a full and final release and a waiver of all such claims by the Contractor.

**59. Review by Project Manager of Contractor Claims and Compulsory Non-Binding Mediation of Contractor Claims.**

a. Within thirty (30) days after receipt of the Contractor's notice to the Project Manager under Paragraph 58(c) above, the Project Manager shall review all identified claims of the Contractor and shall notify the Contractor whether the claims are approved or rejected, in whole or in part.

b. Any claim of the Contractor which shall have been rejected by the Project Manager, in whole or in part, shall be subject to non-binding mediation. Mediation of the claim shall be an irrevocable condition precedent to institution of legal proceedings by the Contractor against the City with respect to such claim.

c. The Contractor must submit its demand for mediation to the Project Manager and the City of Philadelphia Law Department, c/o Chief Deputy City Solicitor, Affirmative and General Litigation Unit not later than 30 days after the Project Manager's notice of rejection. Failure of the Contractor to submit such claim to mediation within this time period shall be an absolute bar to institution of legal proceedings by the Contractor.

d. The Contractor shall submit a written timely request for mediation to the Project Manager and the City of Philadelphia Law Department, c/o Chief Deputy City Solicitor, Affirmative and General Litigation Unit. Upon submission of the claim to mediation, the City and the Contractor shall endeavor to resolve the claim by mediation in accordance with such rules as may be mutually agreed upon by the City and the Contractor.

e. The fee of the mediator, who shall be selected jointly by the parties, and the common expenses and costs incurred in connection with conduct of the mediation, shall be borne equally by the City and the Contractor. The mediation shall be conducted in the City of Philadelphia. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

**60. Contractor's Liability for Services and Materials.**

a. Notwithstanding the acceptance and approval by the City of any work the Contractor shall continue to be responsible for the professional quality, technical accuracy and the coordination of all work under the Contract. The Contractor shall, without additional compensation, correct any defects, deficiencies or omissions in the work.

b. The City's review, approval, or acceptance of, or payment for, any of the work performed under the Contract shall not constitute any representation, warranty, or guaranty by the City as to the substance or quality of the work reviewed, approved, or accepted, and shall not be construed to operate as a waiver or estoppel of any of the City's rights or privileges under the Contract, nor of any cause of action arising out of the performance of the Contract. No Person shall rely in any way on such review, approval or acceptance by the City. The Contractor shall be and remain liable in accordance with the Contract and Applicable Law for all damages to the City caused by the Contractor or the work under the Contract. Review, approval or acceptance by the City or the Project Manager under the Contract shall not constitute approval otherwise required by any City department, board, commission, or other regulatory agency in the exercise of such department's, board's, commission's or agency's independent regulatory authority of police powers under applicable law.

**61. False Claims.** The Contractor covenants and agrees that it shall promptly reimburse the City for (a) all sums paid to the Contractor by the City as a result of any false, fictitious or fraudulent billings, invoices, contract overcharges, and the like, and (b) all other costs which are incurred by the City as a result of the false fictitious or fraudulent billings, invoices, contract overcharges and the like. The Contractor further covenants and agrees that it shall promptly reimburse the City for all expenses and costs, including but not limited to attorneys' fees and expenses, incurred by the City in recovering any such sums from the Contractor. This Paragraph shall survive termination of the Contract and completion of the work under the Contract.

**E. MATERIALS, WORKMANSHIP, AND INSPECTION**

**62. Materials and Workmanship.** The materials used in the work under the Contract shall conform to the requirements of the Plans, Technical Specifications and Standard Details and Specifications, as the same may be applicable. The workmanship shall be equal to the best standard practices. Work of reconstruction and restoration of privately-owned structures adjacent to the Project site shall be as set forth in the Plans and Technical Specifications or otherwise by written agreement with the owner or owners of such structures. Where no requirements are specified for materials or for the methods of testing materials or equipment, such materials or methods shall at least equal the latest standard or tentative specifications of nationally recognized standardizing agencies, such as the American Society of Mechanical Engineers, the latest codes of the National Board of Fire Underwriters or, as they apply, any regulations of the City.

**63. Inspection.** All of the work of the Contract shall be subject to general direction and inspection of the Project Manager or the Project Manager's designated representatives, and the Contractor shall afford every opportunity for the inspection of materials and workmanship. Authorized representatives of the City shall be permitted access at all reasonable times to all portions of the work, and to such portions of the place of manufacture of fabricated materials as may be necessary for complete inspection. Before beginning work the Contractor shall notify the Project Manager of the type and source of supply of the principal materials which the Contractor proposes to furnish, and, as soon as possible thereafter, shall furnish samples of materials, fixtures, and appliances for approval by the Project Manager. Before removal of any excess excavated material, waste, refuse,

or rubble, etc., from the site, the Contractor shall furnish to the Project Manager a list of certified dump site or landfill locations that are to be utilized for disposal of such waste materials and written verification that permission for the disposal of the waste materials has been obtained. Before beginning the fabrication of materials, equipment or systems, and before shipping materials, equipment or systems of a specified type, the Contractor shall notify the Project Manager in ample time to permit inspection at the place of manufacture or shipping, should the Project Manager so desire. Such materials, equipment or systems shall be delivered to the Project site properly marked for identification, and shall be subject to re-inspection and final acceptance or rejection at the Project site by the City. The Contractor shall deliver materials, equipment and systems to be inspected at the Project site in ample time for such inspection and testing. No materials, equipment or systems shall be incorporated into or used in connection with the work until accepted by the Project Manager, and all materials, equipment or systems rejected by the Project Manager as unsuitable or not in conformity with the Plans or Technical Specifications shall be immediately removed from the work. Unless otherwise specifically provided for, the City shall bear the cost of inspection and testing. All work shall be prosecuted in the presence of the City's Inspector ("Inspector"), and conformity with the requirements of the Contract Documents. The Contractor shall provide for inspection and testing to be carried out during regular working hours unless specifically authorized or directed otherwise by the Project Manager. The presence of the Inspector shall not affect in any way the duty of the Contractor to complete the work in accordance with the Contract Documents, nor be deemed a defense on the part of the Contractor for default or violation of the Contract. The Inspector is not authorized to waive, amend, revoke, alter, enlarge, relax, or release any of the requirements of the Contract Documents.

**64. Investigation of Work.** If the Project Manager at any time has reason to suspect that the Contractor may have delivered any unsuitable, unfit or otherwise defective work, the Project Manager may order an investigation thereof, and the Contractor shall furnish the necessary labor and equipment for such investigation. If the City finds that any part of the work is defective, the Contractor shall repair, replace or reconstruct such work to the satisfaction of the Project Manager, and the cost thereof and of such investigation shall be the sole responsibility of the Contractor. If the work is found to be in accordance with the Contract Documents, the City will reimburse the Contractor, in accordance with Paragraph 51 above, for the expense of the examination.

**65. Defective Work or Material.** The Contractor shall remove, at its own expense, any work or material rejected by the Project Manager as unsuitable, unfit, or otherwise defective and not in accordance with the Contract Documents, and shall repair, replace or reconstruct the same without additional compensation. Failure to do so shall be deemed a violation of Contract and shall be subject to the provisions of the Contract concerning violations and defaults. Any omission or failure on the part of the Project Manager to disapprove or reject any work or material shall not be construed to be an approval or acceptance of any such defective work or material. For any work or material that is determined to be defective and not in accordance with the Contract Documents, but which in the sole determination of the Project Manager cannot be remedied or does not require total replacement, the Project Manager shall determine an appropriate credit due the City from the Contractor.

## **F. CONSTRUCTION REQUIREMENTS**

**66. Prosecution and Performance of Work.** The Contractor's methods for the performance of the work must be those best adapted for the safe, efficient, and expeditious prosecution of the work, with a minimum of interference to adjoining work sites, to adjoining properties, and to public traffic and convenience. The Contractor shall prosecute the work vigorously, without delay, and with such workforces and equipment as shall be satisfactory to the Project Manager. The Contractor shall furnish and supply all labor and materials, in the quantity and of the quality required for the proper and timely performance of the work under the Contract; all such materials shall be of the best kind and quality and subject to the inspection and approval of the Project Manager. The Contractor shall strictly conform to the orders, instructions and directions given by the Project Manager, it being expressly understood and agreed that the decision of the Project Manager on any questions arising in connection with the performance of the work under Contract shall be binding and conclusive upon the Contractor. The Contractor shall supervise and direct the work, and Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of its work under the Contract. Before commencing the work, the Contractor, when required by the Project Manager, shall submit for approval its proposed methods of prosecution of the work, including the maintenance



of both vehicular and pedestrian traffic; underpinning, bulk heading, shoring; sinking foundations; handling spoil; lighting; fencing; street surfaces; drainage; and all other branches of its work operation. Such approval is intended to safeguard the City's interest, but such approval will not be deemed to relieve the Contractor of its obligation or responsibility for the safe and proper conduct of the work. The Contractor shall at all times ensure that its work site, and its Subcontractors' personnel, while performing any part of the work under this Contract, are and remain free of the influence of alcohol or illegal drugs. The Contractor shall at all times enforce good discipline and order among its employees, and shall not employ any unfit Person or anyone not skilled in the task assigned. Any contact by the Contractor or its employees with adjacent property owners, passing motorists or pedestrians, and the general public shall at all times be professional, courteous, and respectful.

**67. Right of Way.** Where work is constructed on private property in the lines of an unopened street, the City guarantees the Contractor, for access and construction purposes, the area only within the lines of said street. Where work is constructed over private property, not within the lines of any street upon the City plan, the City guarantees the Contractor right-of-way between lines not more than twenty-five (25) feet, each side, beyond the outside lines of the structure to be built, unless otherwise provided for, with right of access only within the lines of this strip and subject to the limitations of existing structures. Where work is constructed within the lines of an open street, the City guarantees the Contractor use of the area only within the lines of the street, and subject to the requirements of the Standard Contract Requirements and Technical Specifications for maintenance of travel, existing structures, and access to abutting properties.

**68. Maintenance of Traffic and Access to Property.** Traffic of all kinds shall be maintained continuously and access to buildings shall be provided for at all times, except where otherwise specifically permitted by the Contract Documents, or where temporary interference is authorized by the Project Manager, in which case it shall be interrupted only for such time as is necessary to provide temporary substitutes for surfaces disturbed by the construction and to restore street and sidewalk surfaces after the completion of the work. Suitable bridges or other means of access shall be built and maintained to permit owners and occupants to reach their premises. Where necessary, the Contractor shall maintain proper and easy means for passengers to enter or exit public transportation. Where partial occupation of the street is allowed, materials and equipment shall be so placed as to ensure a minimum of interference with traffic; no materials shall be placed on the sidewalk within one foot of the curb line, and a clear sidewalk passage not less than four (4) feet in width shall be maintained at all times. The work shall be so conducted that annoyance to residents and interference with the normal use of the properties will be reduced to a minimum. The flow in gutters and inlets shall be maintained. When access to any adjacent property is temporarily cut off, owing to occupancy of the street by the Contractor, the Contractor shall render every assistance to the owner or occupant in handling materials of every description that must be delivered to or removed from such property, including recyclables, rubbish, and garbage, and such materials shall be taken to or from the nearest accessible point that, in the opinion of the Project Manager, is convenient for handling. No additional compensation will be allowed for the various items of expense noted above in this Paragraph 68.

**69. Maintenance of Waterways.** In navigable streams all work shall be carried on in full compliance with the requirements of the United States Department of the Army, the Commonwealth, the City and any other governmental or quasi-governmental agency, authority or commission having jurisdiction under Applicable Law. Movement of boats and vessels of all kinds shall be maintained unless the United States Department of the Army or any other governmental or quasi-governmental agency, authority or commission having jurisdiction under Applicable Law shall permit interference, and then only within the limits and times specified. Should the Contractor, during the progress of the work, sink, lose, or throw overboard any material, plant, equipment, machinery, etc., which may be dangerous to or obstruct navigation, the Contractor shall forthwith recover and remove the same. The Contractor shall give immediate notice to the proper authorities of such obstruction, and, if required, the Contractor shall, under the direction of such authorities mark or buoy such obstructions until the same are removed. Upon the completion of any work affecting waterways of any character, all equipment and materials deposited in such waterways shall be removed unless otherwise ordered or permitted, so as to leave an unobstructed channel of the same width and depth and with the banks, retaining structures, or wharves in a condition equal to that existing before the beginning of work.

**70. Access to Fire Hydrants and Fire Alarm Boxes.** Fire hydrants shall be left at all times clear of obstructions and readily accessible to fire apparatus. No material or other obstructions shall be placed within ten

(10) feet of a fire hydrant. Fire alarm boxes shall be supported and protected and maintained so as to be readily accessible and open to view. Excavation shall be decked or bridged, where necessary, to permit the safe passage of fire apparatus and to give access to fire hydrants and to adjacent buildings for the extinguishing of fires. Where necessary, branch pipes shall be extended from the nozzles of the fire hydrants to the mains. Fire hydrants and any branch pipes shall be protected from freezing, and the fire hydrants (particularly the high pressure type) shall, where necessary, be braced or tied to the connecting pipes to prevent movement under water pressure.

**71. Temporary Buildings.** Buildings, fences, trailers, and equipment erected or provided by the Contractor shall be neat in appearance. Except as provided in Paragraph 74 below, no advertising matter, other than Project information and the name and address of the Contractor, shall be displayed on the work or any such buildings, fences, trailer or equipment.

**72. Danger Signals.** The Contractor, at Contractor's own expense, shall erect and maintain all necessary barricades, and danger signs and signals. The Contractor shall keep adequate lights burning from sunset until sunrise, and shall provide security personnel as necessary for the safety of the public. The Contractor shall observe such rules relative to signals and safeguards as the police regulations, harbor regulations, and other Applicable Laws require.

**73. Street Closings and Detour Signs.** In the event that the work requires the closing of a street or roadway, the Contractor shall first obtain a permit from the City's Department of Streets. When the Department of Streets gives permission to close a street or roadway during Contract operations and to divert the traffic therefrom, the Contractor, at the Contractor's sole expense, shall erect and maintain appropriate traffic and highway barricades, detour signs, and any other necessary traffic signs in order to safely protect vehicular and pedestrian traffic. The Contractor shall notify the Department seven (7) days prior to the date of starting work and one (1) day prior to the date of completion. Copies of these notices shall be sent to the Traffic Engineer of the Department of Streets.

**74. Contract Identification Signs.** The Contractor shall, unless specified otherwise in the Technical Specifications, at Contractor's own expense, erect and maintain in a prominent position upon the Project site at a location approved by the Project Manager, a suitable sign, plainly lettered with the name and address of the Contractor, the character of the work and the name of the Department under which the Contract is being carried out. No advertising matter other than the signs above noted shall be displayed on the work.

**75. Safety and Sanitary Provisions.** The Contractor shall provide means and appliances and shall enforce suitable rules for the safe prosecution of the work and for the safety and health of the work force employed on it. The completed portions of the work shall be kept clean and in a sanitary condition. The Contractor shall provide and maintain properly secluded sanitary conveniences, in accordance with existing regulations of the Department of Public Health, for the use of Contractor's work force, and the Contractor shall strictly enforce the exclusive use of them by its work force.

**76. Storage Space.** Buildings, yards, or sidings that may be required for the delivery or storage of materials shall be provided by and at the cost of the Contractor. The Contractor may not use streets for storing materials unless otherwise specifically authorized in writing by a permit issued by the City's Department of Streets. Upon request of the Project Manager, the Contractor shall furnish a copy of any agreement for the use of a property or building for construction purposes, except where owned by the Contractor.

**77. Night Work.** Work during the night shall be carried on with due regard to the comfort of, and so as to minimize any disturbance to, nearby residents, and the methods to carry out such work shall be subject to the approval of the Project Manager, who may, if conditions so require, order that no night work be done in specific localities. The Contractor's work force shall refrain from loud noises, calls, whistles, and the operation of air compressors, rock drills, riveting machinery, and blasting between the hours of 7:00 p.m. and 7:00 a.m. unless specifically permitted by the Project Manager.

**78. Power and Light.** In developed portions of the City, and elsewhere when ordered by the Project Manager, the Contractor shall use either electric, compressed air or internal combustion engine power. When compressed internal combustion engines are used the exhaust shall be muffled. None but electric lights

shall be used in or under buildings or anywhere on the work below the surface of the street.

**79. Use of Water.** Permission for the use of City water shall be obtained directly from the Philadelphia Water Department. Water may be obtained through a hydrant attachment or as otherwise specified in the Technical Specifications. In all cases, the Contractor shall obtain and use such water in accordance with regulations of the Water Department. If the Contractor shall, at any time, waste water (as determined by the Project Manager) obtained from the Water Department, the Project Manager shall revoke permission for such use. No charge will be made for the use of water actually used for the construction work, unless specifically set forth elsewhere in the Technical Specifications.

**80. Prevention of Dust and Smoke.**

a. The Contractor shall keep the surface of the sidewalks and streets affected by its work, including decking and temporary paving, in a clean, neat condition. The Contractor shall sprinkle with water or otherwise treat the surface sufficiently to keep down any dust generated during the progress of work. Piles of dirt or other material shall not be left on the surface. The aforementioned requirements are not intended to take the place of the usual duties of the Department of Streets but to supplement them. No fires of any kind or burning of debris on the site or adjacent to it will be permitted; the debris shall be disposed of off the Project site.

b. The Contractor shall comply strictly with the provisions of the Air Pollution Code (Title 3 of The Philadelphia Code, as amended).

**81. Explosives.** If any blasting is involved in the performance of the Contract, the Contractor must obtain a blasting permit from the Department of Licenses and Inspections. Such permits will be issued only upon approval of the Fire Marshal and posting of bond or Certificate of Insurance covering personal injuries and property damage. Blasting may be done only by blasters duly licensed by the City. Storage of explosives and transportation of explosives to the site also require permits, which are issued by the Department of Licenses and Inspections, subject to prior approval of the Fire Marshal.

**82. Work in Freezing Weather.** Masonry of all kinds, pointing, grouting, plastering, and other work subject to the action of frost shall not be done when exposed to freezing weather, except under conditions where the Project Manager may specifically direct or permit such work, subject to the heating of materials, the protection of finished work and such other measures as may be deemed necessary. If operations are suspended on account of freezing weather, the entire work shall be properly protected until the resumption of work is permitted. If a suspension of the work on account of freezing weather or from any other cause is necessary, the site shall be cleaned up, left in good order, and continuously maintained by the Contractor during the period of such suspension.

**G. SURFACE, SUBSURFACE, AND OVERHEAD STRUCTURES**

**83. Completeness of Data.** The term "structures" used in these Standard Contract Requirements shall apply to all surface, underground, and above-ground structures of whatever character within the Project site or immediately adjacent thereto, including buildings situated in or adjacent to the excavation. Where these structures are shown or indicated on the Plans, the information provided is in accordance with the information in the possession of the Department, but is approximate only. Such data are not warranted or guaranteed by the Department to be either complete or correct, and the Contractor shall and must assume, and adjust its Quote to account for, all risks resulting from conditions in the field that differ from the approximation shown.

**84. Support and Protection.** All structures, unless specifically designated by the Project Manager to be abandoned or relocated, shall be supported and protected at all times from destruction or injury, including damage from freezing, and maintained continuously in service. Should any injury occur while the work is in progress and the structures are under the protection of the Contractor, the Contractor shall fully restore such structures to as good condition as existed before the injury was done. All such support and protection work, and also such alterations of any structures as the Contractor may carry out for the Contractor's own convenience in executing the work, shall be done without additional compensation, unless otherwise specifically provided for in the Contract Documents. The City makes no covenant, representation or warranty as to the right of the

City or the Contractor to carry out any such support or protection work, or any alterations of any structures for the Contractor's own convenience; all such work being in any and all events subject to the consent and approval of the owner or owners of such structures.

**85. Structures Interfering with Construction.** If, in the course of the work, the Contractor determines that any of the existing structures occupy space required by the structure or its appurtenances to be constructed under the Contract, or that such structures are so situated as to render it impracticable, in the opinion of the Project Manager, to do the work called for under the Contract in the manner specified, the Contractor shall excavate and uncover the portions of such structures in service and shall notify the Project Manager, who will, if reasonably practicable, arrange for the alteration, relocation or removal of the interfering structures or appurtenances within a reasonable time. The Contractor shall not move nor disturb such structures in any way without prior approval by the owners thereof, and the approval of the Project Manager. Any such action by the Contractor shall be at the Contractor's sole cost, risk and expense. Structures belonging to the public utility companies, which are ordered by the Project Manager to be removed or relocated, will be so removed or relocated and permanent supports placed, in general by their owners without cost to the Contractor. The Contractor, however, shall support and protect them up to the time of their removal, shall co-operate with such owners during the process of relocation, and shall maintain and protect such structures if and when such structures are relocated within the Project site or immediately adjacent thereto. Such work shall be done without additional compensation. Sewers, water pipes, electrical conduits, and other City-owned structures shall be altered, relocated, or reconstructed as shown on the Plans or as may be ordered in the course of the work. Payment for this work will be made at the applicable prices in the Contract unless otherwise specifically provided for. If the Project Manager approves a request by the Contractor to effect a temporary or permanent relocation of structures for Contractor's own convenience, and satisfactory arrangements can be made with the owners thereof, the Contractor may carry out such work at its own expense.

**86. Abandonment of Structures.** In the case of structures the service of which is permanently abandoned, the Project Manager will designate which such structures or portions of such structures the Contractor may salvage and which the Contractor may abandon in place on the Project site, including in the trench. The Contractor shall remove and deliver to a designated point of storage materials salvaged, and payment therefor will be made at the appropriate prices of the Contract, unless otherwise specifically provided. The Contractor shall allow owners of privately owned structures reasonable facilities for salvaging their property. Structures designated as abandoned shall become the property of the Contractor, and shall be removed from the work, unless the Project Manager has approved abandonment of such structures in place on the Project site.

**87. Co-operating with Public Utility Companies and City Departments.**

a. The Contractor shall at all times during the performance of the work fully comply with the Underground Utility Line Protection Law (Act 287 of 1974, as amended by Act 121 of 2008), 73 P.S. § 176 et seq., otherwise known as the PA One Call System.

b. The Contractor shall co-operate with other contractors and with the employees, officers, and agents of the City Departments or the various public utility companies which own, operate, or have supervision over the underground or above-ground structures encountered by the Contractor, and shall conform to the requirements of the owners of such structures in regard to their safe maintenance. The Contractor shall give to authorized representatives of the City Departments and public utility companies unrestricted access at all times to the excavation and site to inspect the condition and support of their structures at no additional cost to the City. Suitable arrangements shall be provided to facilitate access to valves and manholes if necessary. Ventilation openings shall be provided where gas is likely to accumulate. Where structures are to be constructed by the Contractor under the facilities of any public utility, the Contractor shall make suitable arrangements with the public utility company for the removal or support and maintenance of such facilities at no additional cost to the City.

**88. Gas Pipes.** Philadelphia Gas Works ("PGW") will make any necessary alterations to the gas mains or gas service pipes, without expense to the Contractor, unless specifically indicated elsewhere in the Contract Documents. PGW will by-pass the gas service in temporary pipes laid outside such excavation, in advance of the construction work. The mains and services that have been removed may be replaced in their permanent position

after the backfilling has been sufficiently compacted.

**89. Traffic Control Apparatus.** The Contractor acknowledges that the underground location of conduit and cables for traffic signals at intersecting streets is not ordinarily shown on the Plans for the work. Where traffic signals are indicated on the Plans, but the location of connecting conduit or cables for the signals is not shown, the Contractor shall nonetheless assume that there are underground conduits and cables that may affect or interfere with the performance of its work and the Contractor shall adjust its Quote accordingly. The Contractor shall support and maintain in their present locations, or in approved temporary locations, any existing traffic control masts, signals, apparatus, and their connecting underground or above-ground conduits and cables, in such condition as to permit the uninterrupted functioning of the signals during the progress of the work, on temporary poles if necessary, and in a manner satisfactory to the Department of Streets. If the existing signal apparatus is supported on poles and these poles are moved to a temporary location during the progress of the work, the Contractor shall either erect temporary signal poles in the approximate locations of the original poles and erect the signals thereon, or shall extend the electrical connection to the poles as relocated as may be ordered by the Project Manager. Upon the restoration of surface conditions, the Contractor shall restore the equipment, including underground or above-ground conduits and cables and electrical connections, to its original position and condition. This work, except new masonry, shall be done without additional compensation to the Contractor. Masonry piers will be paid for at the applicable unit prices.

**90. Vaults.** The City will secure the vacating of vaults interfering with the work without expense to the Contractor; but reasonable time shall be allowed the owners for the removal of materials and of any mechanical or other equipment that may be installed therein. These vaults will be vacated to the extent necessary, in the opinion of the Project Manager, to do the work called for under this Contract, including underpinning. The Contractor shall make arrangements with the owners of such vaults in regard to its occupation thereof and shall give the owners at least two (2) weeks' notice of Contractor's intention to remove or break into the walls.

**91. Street Lighting Units.** Whenever it is necessary to remove, relocate, or adjust street lighting units, or poles, the work shall be reviewed and approved by the City's Department of Streets – Street Lighting Division. All such street lighting work shall be performed at the sole expense of the Contractor and at no additional cost to the City, unless otherwise pre-approved in writing by the Project Manager and the Street Lighting Division.

#### **H. MISCELLANEOUS PROVISIONS**

**92. Governing Law.** The Contract shall be deemed to have been made in Philadelphia, Pennsylvania. The Contract and all disputes arising under the Contract shall be governed, interpreted, construed and determined in accordance with the laws of the Commonwealth, without giving effect to principles of Commonwealth law concerning conflicts of laws.

**93. Binding Upon Contractor's Successors, etc.** The Contract shall be binding upon the Contractor's heirs, executors, administrators, and successors and assigns and such successors and assigns shall be responsible for the faithful performance and completion of the Contract work.

**94. Amendments; Waiver.** The Contract may not be amended, supplemented, altered, modified or waived, in whole or in part, except by a written Amendment, or other writing, signed by the Parties, or as provided in Paragraphs 20 and 21 above concerning cancellation of the Contract by the Contractor and termination for convenience by the City, or as provided in Paragraphs 48 and 49 concerning Change Orders and Disputed Change Orders, respectively. Except to the extent that the Parties may have otherwise agreed in writing in an Amendment, or other writing, no waiver, whether express or implied, by either Party of any provision of the Contract shall be deemed: (a) to be a waiver by that Party of any other provision in the Contract; or (b) to be a waiver by that Party of any breach by the other Party of its obligations under the Contract. Any forbearance by a Party in seeking a remedy for any noncompliance or breach by the other Party shall not be deemed to be a waiver of rights and remedies with respect to such noncompliance or breach.

**95. Interpretation and Order of Precedence.** If the Technical Specifications, the Proposal, or the

Plans expressly modify any of the terms, conditions, or requirements of these Standard Contract Requirements, or of the Department's Standard Details and Specifications, such Technical Specifications, Proposal or Plans shall supersede the portions of these Standard Contract Requirements or the Department's Standard Details and Specifications with which they conflict. The foregoing to the contrary notwithstanding, the City and the Contractor expressly understand that in no event shall the provisions of Paragraph 4 of these Standard Contract Requirements (with respect to test borings, test piles, and existing underground and above- ground structure locations) be superseded by the Technical Specifications, the Proposal, or the Plans.

**96. Integration.** The Contract Documents, including these Standard Contract Requirements and the exhibits incorporated by reference therein, contain all the terms and conditions agreed upon by the Parties, constitute the entire agreement between the Parties pertaining to the subject matter of the Contract, and supersede all prior agreements, understandings, negotiations and discussions, whether oral or written, of the Parties (except to the extent specifically set forth therein). No other prior or contemporaneous agreements, covenants, representations or warranties, oral or otherwise, regarding the subject matter of the Contract shall be deemed to exist or to bind any Party or vary any of the terms contained in the Contract.

**97. No Joint Venture.** The Parties do not intend to create, and nothing contained in the Contract shall be construed as creating, a joint venture arrangement or partnership between the City and the Contractor with respect to the work performed by the Contractor under the Contract.

**98. No Third Party Beneficiaries.** Nothing in the Contract, express or implied, is intended or shall be construed to confer upon or give to any Person, other than the Parties, any rights, remedies, or other benefits, including, but not limited to, third-party beneficiary rights, under or by reason of the Contract. The Contract shall not provide any third party with any remedy, claim, liability, reimbursement, cause of action or other right other than any such remedy, claim, etc. existing without reference to the term of or the existence of the Contract.

**99. Severability and Partial Invalidity.** The provisions of the Contract shall be severable. If any provision of the Contract or the application thereof for any reason or in any circumstance shall to any extent be held to be invalid or unenforceable, the remaining provisions of the Contract and the application of such provision to Persons, or in circumstances, other than those to which it is held invalid or unenforceable, shall not be affected thereby, and each provision of the Contract shall be valid and enforceable to the fullest extent permitted by law.

**100. Survival.** Any and all provisions set forth in the Contract which, by its or their nature, would reasonably be expected to be performed after the termination of the Contract or after full performance of the work under the Contract shall survive and be enforceable after such termination. Any and all liabilities, actual or contingent, which shall have arisen in connection with the Contract shall survive the expiration or earlier termination of the Contract, along with the following: the Contractor's warranty of its work, the Contractor's obligation to indemnify, defend and hold harmless the City, its officers, employees and agents; and the Parties' rights and obligations set forth in Paragraph 31 (Proprietary Rights Indemnity).

**101. Controlling and Pertinent Statutes.** All statutory citations in the Contract shall refer to the pertinent statute as it may be amended hereafter from time to time.

**102. Forum Selection Clause; Consent to Jurisdiction.** The Parties irrevocably consent and agree that any lawsuit, action, claim, or legal proceeding involving, directly or indirectly, any matter arising out of or related to the Contract shall be brought exclusively in the United States District Court for the Eastern District of Pennsylvania or the Court of Common Pleas of Philadelphia County. It is the express intent of the Parties that jurisdiction over any lawsuit, action, claim, or legal proceeding shall lie exclusively in either of these two (2) forums. The Parties further irrevocably consent and agree not to raise any objection to any lawsuit, action, claim, or legal proceeding which is brought in either of these two (2) forums on grounds of venue or *forum non conveniens*, and the Parties expressly consent to the jurisdiction and venue of these two (2) forums. The Parties further agree that service of original process in any such lawsuit, action, claim or legal proceeding may be duly effected by mailing a copy thereof, by certified mail, postage prepaid, in the case of the Contractor, to the address specified in the Quote, and in the case of the City, to The City of Philadelphia Law Department, Attention:

City Solicitor at the then-current address of the Law Department.

**103. Waiver of Jury Trial.** The Contractor hereby waives trial by jury in any legal proceeding in which the City is a party and which involves, directly or indirectly, any matter (whether sounding in tort, Contract or otherwise) in any way arising out of or related to the Contract or the relationship created or evidenced thereby. This provision is a material consideration upon which the City relied in entering into the Contract.

**104. Headings.** The titles, captions or headings of Paragraphs, sections, exhibits or schedules in or to the Contract are inserted for convenience of reference only, and do not in any way define, limit, describe or amplify the provisions of the Contract or the scope or intent of the provisions, and are not a part of the Contract.

**105. Days.** Any references to a number of days in the Contract shall mean calendar days, unless the Contract specifies Working Days or business days.

**106. Notice.** All notices, demands, requests, waivers, consents, approvals or other communications which are required or may be given under the Contract shall be in writing and shall be deemed to have been duly made (a) when received or refused if delivered by hand with receipt given or refused; (b) on the next business day if delivered by a nationally recognized overnight courier service (*e.g.*, Federal Express or United Parcel Service); (c) on the date confirmed for receipt by facsimile if delivered by facsimile; and (d) upon receipt or refusal of delivery if sent by certified or registered United States mail, return receipt requested. In each case notices shall be sent, in the case of notices to the Contractor, to the address or addresses set forth in the Contractor's Quote, and in the case of the City, to the address set forth in the City's Notice to Proceed, to the attention of the Project Manager, or to such other address as either Party may specify to the other by a notice complying with the terms of this Paragraph 106.

#### I. SPECIFIC LAWS

The following provisions are not intended to limit the applicability of any of the other provisions of the Contract:

**107. Labor-Management Relationships; Prevailing Wages.** The Contract is subject to Section 17-107, as amended, of The Philadelphia Code, "Contractors: Labor-Management Relationships", and all regulations and procedures adopted thereunder.

a. As required by Section 17-107 of The Philadelphia Code all employees performing work under the Contract shall be paid at least the applicable prevailing wages for the respective occupational classifications designated, as set forth in the minimum wage schedule attached as part of the General Bidding and Contract Requirements, and shall be given at least the applicable presently prevailing working conditions during the entire period of work under the Contract. Such working conditions are those which are given to employees pursuant to a bona fide collective bargaining agreement for the applicable craft, trade or industry in the Philadelphia area on the date the General Bidding and Contract Requirements are issued. The occupational classifications for all employees under the Contract shall be only the specific categories of jobs within a given craft, trade or industry for which a separate hourly wage rate for the Philadelphia area is determined by the Secretary of Labor of the United States, in accordance with the provisions of the Davis-Bacon Act, and which are set forth in the applicable schedule attached to the General Bidding and Contract Requirements. In the event that any Contractor believes that work under the Contract should be performed by employees in occupational classifications omitted from the schedule attached to the General Bidding and Contract Requirements, it shall so advise the Managing Director's Office (the "MDO"), Labor Standards Division, which shall remedy the omission if it agrees.

b. The City may withhold from any sums due to the Contractor under the Contract so much as may be necessary to pay the employees the difference between the wages required to be paid under this Paragraph 107 and the wages actually paid to such employees, and the City may make such payments directly to the appropriate employees.

c. Each Contractor shall require all Subcontractors to comply with and be bound by all of the

provisions of this Paragraph of the Contract and of Section 17-107 of The Philadelphia Code, and the Contractor shall insert the requirements of Section 17-107 in all Subcontracts.

d. Every Contractor and Subcontractor shall keep an accurate record preserved on employee time sheets or time cards showing the name, address, social security number, occupational classification, wages and other benefits paid or provided and number of hours worked for each employee assigned to city-work (as "city work" is defined in Section 17-107(1)(b) of The Philadelphia Code), and such record shall be preserved at the current place of business of the employing Contractor or Subcontractor for two (2) years from the date of the Final Estimate on the Contract. The Contractor shall maintain and make his or her accounting and employment records and records relating thereto available for inspection by authorized representatives of the City, at all reasonable hours, and shall permit such representatives to interview employees during the hours on the job, all without prior notice. Neither the Contractor nor any Subcontractor shall allow any employee or other person to interfere with any such inspection or interview.

e. All Contractors and Subcontractors performing city-work shall, upon request of the City, file with the MDO, Labor Standards Division a certified statement setting forth the name, address, occupational classification, wages and other benefits paid or provided and number of hours worked with respect to each employee performing city work. Such statement shall be made weekly for each preceding weekly period. The certification shall affirm that the statement is correct and complete, that the wages set forth therein are not less than those required by the Contract for city-work and that the occupational classification set forth for each employee conforms with the work performed.

f. Nothing herein shall preclude the payment by the Contractor of wages at rates higher than those specified as the minimum in the applicable schedule attached to the General Bidding and Contract Requirements. However, no increase in any Contract price shall be allowed or authorized on account of the payment of wages in excess of those so specified, or on account of wage increases granted hereafter. No increases above the amounts specified in the applicable schedule attached to the General Bidding and Contract Requirements will be required by any Contract during the term thereof except in the case of an error or omission in such schedule. Such an error or omission shall be called to the attention of the MDO, Labor Standards Division as promptly as possible; but the remedying thereof by the Department shall not constitute grounds for withdrawal of a Quote or cancellation of a Contract, nor for an increase in the Contract price or other claim or recovery against the City, nor a ground for failure or refusal to pay the applicable proper minimum to all employees.

g. The minimum wages required hereby shall be paid unconditionally without any subsequent deduction or rebate of any kind except in accordance with Applicable Law governing payroll deductions for taxes, benefits and collective bargaining charges. Any assignment of wages by an employee for the direct or indirect benefit of the Contractor shall constitute a violation of this Paragraph; and any purported release of rights under Section 17-107 of The Philadelphia Code by an employee shall be void and of no effect.

h. The Parties shall refer to Section 17-107 of The Philadelphia Code, and to the regulations to be issued from time to time by the MDO, Labor Standards Division, for further information concerning the administration of the foregoing requirements of this Paragraph 107. In addition, it shall be the responsibility of all Sellers and Contractors to inform themselves as to all prevailing working conditions, including, without limitation, length of work day and work week, overtime compensation, and holiday and vacation rights.

**108. Non-Discrimination; Fair Practices.**

a. The Parties acknowledge that they have entered into and perform the Contract under the terms of the Philadelphia Home Rule Charter, as it may be amended from time to time, and in performing the Contract, the Contractor shall not discriminate or permit discrimination against any individual because of race, color, religion or national origin. In addition, the Contractor shall, in performing the Contract, comply with the provisions of the Fair Practices Ordinance of The Philadelphia Code (Chapter 9-1100, as amended) and the Mayor's Executive Order No. 4-86, as each may be amended from time to time, both of which prohibit, among other things, discrimination against individuals because of race, color, sex, sexual orientation, religion, national origin, ancestry, age, handicap (including but not limited to Human Immunodeficiency Virus infection), marital



status, presence of children or source of income, in employment, housing and services in places of public accommodation. In the event of any breach of this Paragraph 108, the City may, in addition to any other rights or remedies available under the Contract, at law or in equity, suspend or terminate the Contract forthwith.

b. In accordance with Act 57 of 1998, 62 Pa.C.S. §3701, as amended, in the hiring of employees for the performance of work under the Contract or any Subcontract, neither the Contractor, nor any of its Subcontractors, nor any Person acting in their behalf shall discriminate, by reason of gender, race, creed, or color, against any citizen of the Commonwealth who is qualified and available to perform the work to which the employment relates. In addition, neither the Contractor, nor any of its Subcontractors, nor any Person acting in their behalf shall in any manner discriminate against or intimidate any employee hired for the performance of work under the Contract on account of gender, race, creed, or color. In addition to any other remedies available to the City, the Contract may be cancelled or terminated by the City and all money due on or to become due under the Contract may be forfeited for a violation of the terms or conditions of this Paragraph 108(b).

**109. Employment of Low - and Moderate - Income Persons.** The Contract is subject to Section 17-1000, as amended, of The Philadelphia Code, "Employment of Low- and Moderate-Income Persons by City Contractors", and all regulations and procedures adopted thereunder.

a. As required by Section 17-1000 of The Philadelphia Code, for all construction and demolition contracts entered into by the City with a total value in excess of \$150,000 (a "Covered Construction Contract"), the Contractor must certify to the Procurement Department that at least forty percent (40%) of the workers who work on a Covered Construction Contract are low- or moderate-income persons. Apprentices and those working in on-the-job training positions shall be considered workers for the purpose of meeting the requirements of Section 17-1000.

b. A low- or moderate-income person is defined under Section 17-1000 as a person whose income does not exceed more than eighty percent (80%) of the median income for the Philadelphia metropolitan area, as determined or adjusted by the Secretary of Housing and Urban Development pursuant to 42 U.S.C. §5302(a)(20), as amended. A person who no longer meets the income eligibility criteria set forth in Section 17-1000 because of employment by a party to a Covered Construction Contract, but who met the criteria on his or her date of hire, shall be deemed a low- or moderate-income person for three years from the date of hire.

c. Each Contractor shall require all Subcontractors to comply with and be bound by all of the provisions of this Paragraph of the Contract and of Section 17-1000 of The Philadelphia Code, and the Contractor shall insert the requirements of Section 17-1000 in all Subcontracts.

**110. Ethics Requirements.** To preserve the integrity of City employees and maintain public confidence in the competitive bidding system, the City intends to vigorously enforce the various ethics laws as they relate to City employees in the bidding and execution of contracts to which the City is a party. Such laws are in three categories:

a. Executive Order No. 02-04, which prohibits City employees from soliciting or accepting anything of value from any Person seeking to initiate or maintain a business relationship with the City, including but not limited to any of its departments, boards, commissions or agencies. All City employees presented with gifts or gratuities as indicated in Executive Order 02-04 have been instructed to report these actions to the appropriate authorities. All Sellers, agents or intermediaries who are solicited for gifts or gratuities by City employees are urged to report these actions to the appropriate authorities, including but not limited to the Inspector General.

b. Section 10-102, as amended, of the Philadelphia Home Rule Charter, which prohibits any Quote from being accepted from, or contract awarded to any City employee or official, or any firm in which a City employee or official has a direct or indirect financial interest. All Sellers are required to disclose any current City employees or officials who are employees or officials of the Seller's firm, or who otherwise would have a financial interest in the Contract.

c. The State Ethics Act and the City Ethics Code, which prohibit a public employee from using

his or her public office or any confidential information gained thereby to obtain financial gain for himself or herself, a member of his or her immediate family, or a business with which he or she or a member of his or her immediate family is associated. "Use of public office" is avoided by the employee or official publicly disclosing the conflict and disqualifying himself or herself from official action in the matter, as provided in The Philadelphia Code §20-608, as amended.

**111. The Philadelphia Code, Chapter 17-400.**

a. In accordance with Chapter 17-400 of The Philadelphia Code, as it may be amended from time to time, Contractor agrees that its payment or reimbursement of membership fees or other expenses associated with participation by its employees in an exclusionary private organization, insofar as such participation confers an employment advantage or constitutes or results in discrimination with regard to hiring, tenure of employment, promotions, terms, privileges or conditions of employment on the basis of race, color, sex, sexual orientation, religion, national origin or ancestry, constitutes, without limiting the generality of Paragraph 32 (Default and Remedies), a substantial breach of the Contract entitling the City to all rights and remedies provided herein or otherwise available at law or in equity.

b. The Contractor agrees to include the immediately preceding subparagraph, with appropriate adjustments for the identity of the parties, in all Subcontracts which are entered into for work to be performed pursuant to the Contract.

c. The Contractor agrees to cooperate with the City's Commission on Human Relations in any manner which the Commission deems reasonable and necessary for the Commission to carry out its responsibilities under Chapter 17-400 of The Philadelphia Code. The Contractor's failure to so cooperate shall constitute, without limiting the applicability of Paragraph 32 (default and remedies), a substantial breach of the Contract entitling the City to all rights and remedies provided herein or otherwise available at law or in equity.

**112. Federal Laws.** The Contractor shall comply with the provisions of Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d – 2000d7), section 504 of the Federal Rehabilitation Act of 1973 (29 U.S.C. § 794), The Age Discrimination Act of 1975, (42 U.S.C. §§ 6101 – 6107), Title IX of the Education Amendments of 1972 (20 U.S.C. § 1681), and 45 C.F.R. Part 92, as they may be amended from time to time, which together prohibit discrimination on the basis of race, color, national origin, sex, handicap, age and religion.

**113. Americans With Disabilities Act.** Contractor understands and agrees that no individual with a disability shall, on the basis of the disability, be excluded from participation in the Contract or from activities or services provided under the Contract. As a condition of accepting and executing the Contract, Contractor shall comply with all provisions of the Americans With Disabilities Act (the "ADA"), 42 U.S.C. §§ 12101 – 12213, as amended, and all regulations promulgated thereunder, as the ADA and regulations may be amended from time to time, which are applicable (a) to Contractor, (b) to the benefits, services, activities, facilities and programs provided in connection with the Contract, (c) to the City, or the Commonwealth, and (d) to the benefits, services, activities, facilities and programs of the City or of the Commonwealth, and, if any funds for payments by the City or otherwise under the Contract are provided by the federal government, which are applicable to the federal government and its benefits, services, activities, facilities and programs. Without limiting the applicability of the preceding sentence, Contractor shall comply with the "General Prohibitions Against Discrimination," 28 C.F.R. Part 35.130, and all other regulations promulgated under Title II of the ADA, as they may be amended from time to time, which are applicable to the benefits, services, programs and activities provided by the City through Contracts with outside contractors.

**114. The Philadelphia Code, Section 17-104.** In accordance with Section 17-104, as amended, of The Philadelphia Code, the Contractor, by execution of this Contract, certifies and represents that (1) the Contractor (including any parent company, subsidiary, exclusive distributor or company affiliated with Contractor) does not have, and will not have at any time during the term of the Contract (including any extensions thereof), any investments, licenses, franchises, management agreements or operations in Northern Ireland and (2) no product to be provided to the City under the Contract will originate in Northern Ireland, unless the Contractor has implemented the fair employment principles embodied in the MacBride Principles.

a. In the performance of the Contract, the Contractor agrees that it will not utilize any suppliers, Subcontractors or subconsultants at any tier (1) who have (or whose parent, subsidiary, exclusive distributor or company affiliate have) any investments, licenses, franchises, management agreements or operations in Northern Ireland or (2) who will provide products originating in Northern Ireland unless said supplier, subconsultant or Subcontractor has implemented the fair employment principles embodied in the MacBride Principles.

b. The Contractor agrees to cooperate with the City's Director of Finance in any manner which the said Director deems reasonable and necessary to carry out the Director's responsibilities under Section 17- 104 of The Philadelphia Code. The Contractor expressly understands and agrees that any false certification or representation in connection with this Paragraph and any failure to comply with the provisions of this Paragraph shall constitute a substantial breach of the Contract entitling the City to all rights and remedies provided in the Contract or otherwise available at law (including, but not limited to, Section 17-104 of The Philadelphia Code) or in equity. In addition, the Contractor acknowledges and understands that false certification or representation is subject to prosecution under Title 18 Pa.C.S. §4904, as amended, concerning unsworn falsification to authorities.

**115. Steel Products Procurement Act.** The Steel Products Procurement Act, 73 P.S. § 1881, et seq., as amended, shall govern payments to the Contractor under the Contract. In seeking payment under the Contract, the Contractor represents, warrants and covenants that only steel products made in the United States as defined by the Steel Products Procurement Act have been used or supplied in the performance of the Contract and all Subcontracts thereunder. Where unidentified steel products are supplied or used under the Contract, the City will not authorize, provide for, or make any payments to the Contractor for such steel products, unless and until the Contractor shall first provide to the Project Manager documentation, including, but not limited to, invoices, bills of lading, and mill certification, attesting that the steel was melted and manufactured in the United States. Where a steel product is identifiable from its face, the City will authorize, provide for, and make payments to the Contractor for such steel products, only after the Contractor shall have submitted a certification, in a form satisfactory to the Project Manager, that the Contractor has fully complied with the requirements of the Steel Products Procurement Act. Where the Project Manager has determined, in writing that a particular steel product is not produced in the United States in sufficient quantities to satisfy the requirements of the Contract, then this Paragraph shall not apply to payments for that steel product. Failure of the Contractor to comply with the Steel Products Procurement Act shall constitute a violation of the Contract which shall entitle the City to exercise all rights and remedies provided to it by the Steel Products Procurement Act and provided to it under the Contract, either at law or in equity.

**116. Business, Corporate and Slavery Era Insurance Disclosure.** In accordance with Section 17-104, as amended, of The Philadelphia Code, the Seller, after execution of the Contract, will complete an affidavit certifying and representing that the Seller (including any parent company, subsidiary, exclusive distributor or company affiliated with Seller) has searched any and all records of the Seller or any predecessor business entity regarding records of investments or profits from slavery or slaveholder insurance policies during the slavery era. The names of any slaves or slaveholders described in those records must be disclosed in the affidavit.

The Seller expressly understands and agrees that any false certification or representation in connection with this Paragraph and/or any failure to comply with the provisions of this Paragraph shall constitute a substantial breach of this Contract entitling the City to all rights and remedies provided in this Contract or otherwise available in law (including, but not limited to, Section 17-104 of The Philadelphia Code) or equity and the contract will be deemed voidable. In addition, it is understood that false certification or representation is subject to prosecution under Title 18 Pa.C.S.A. Section 4904, as amended, concerning unsworn falsification to authorities.

**117. Transparency in Business Act.** If this Contract is valued over \$100,000, the following requirements shall apply:

a. After Contractor has been notified of its selection for the contract award and prior to formal written agreement to the Contract, Contractor shall disclose the following information:

1. The Contractor's and each anticipated Subcontractor's prior years of experience performing on City contracts in any capacity during the five calendar years prior to the date the application must be filed.

2. Demographic Data on all individuals employed by the Contractor and each anticipated Subcontractor on the Report Date.

3. Demographic Data on all individuals serving as board members of the Contractor on the Report Date.

4. Demographic Data on all individuals employed for each Labor Source from which workers are likely to be drawn in performance of the Contract. Submission to the Department of Labor of Demographic Data on a Labor Source by any contractor during the previous 6 months shall satisfy the disclosure requirements with respect to such Labor Sources. The Department of Labor shall provide notice no later than one week prior to the time of the opening of bids for each contract of all Labor Sources for which Demographic data has been provided during the previous 6 months.

5. Demographic Data of all employees who will perform work under the Contract.

b. At each renewal term or additional performance period, the Contractor shall submit updated Demographic Data of the individuals performing work on the Contract in the form of a supplemental disclosure. Submission of certified payroll records shall satisfy this disclosure requirement.

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PREVAILING WAGE RATE

**NOTICE TO SELLERS**

**Contractors and their subcontractors are required to submit weekly certified payroll records to the Labor Standards Unit through an electronic system, LCP Tracker, or as directed by the Labor Standards Unit. Failure to pay Prevailing Wage, as applicable, or to submit certified payroll records is a substantial breach of Contract and may be subject to fines and penalties as prescribed by Section 17-107 of The Philadelphia Code which may include withholding from any sums due to the Contractor under the Contract so much as may be necessary to pay the employees the difference between the wages required to be paid hereunder and the wages actually paid to such employees, and the City may make such payments directly to the appropriate employees.**



**PREVAILING WAGE RATE SCHEDULE  
 FOR CONSTRUCTION WORK DONE ON BEHALF OF CITY OF PHILADELPHIA  
 INCLUDING REPAIR, ALTERATION, AND REMODELING WORK**

**I. BUILDING CONSTRUCTION**

**A. Job Classification and Wage Rates**

	Basic Hourly Rate	Fringe Benefits
<b>ASBESTOS WORKER</b>		
Journeyman	56.65	40.90
Handler Level 1	31.53	23.74
Handler Level 2	45.69	23.74
<b>BOILERMAKER</b>	50.17	35.30
<b>BRICKLAYER</b>	46.45	31.21
<b>CARPENTER</b>	50.75	29.46
<b>CEMENT MASON</b>	42.05	33.46
<b>(as of 5/1/2023)</b>	43.70	33.46
<b>DRY WALL FINISHER</b>	41.77	30.60
<b>ELECTRICIAN</b>	65.76	43.48
<b>(Telecommunication Senior Tech)</b>	63.97	31.53
<b>(Telecommunication Tech A)</b>	60.13	29.64
<b>ELEVATOR CONSTRUCTOR</b>	63.52	37.485

**FOOTNOTES FOR ELEVATOR MECHANICS:**

**A. PAID VACATION:** Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% for 6 months to 5 years of service.

**B. Eight Paid Holidays (provided employee has worked 5 consecutive days before and the working day after the holiday):** New Year's Day; Memorial Day; Independence Day; Labor Day; Veteran's Day; Thanksgiving Day and the Friday after Thanksgiving Day, and Christmas Day.

<b>GLAZIER</b>	46.09	35.61
<b>IRONWORKER</b>		
Structural & Ornamental	47.70	39.16
Reinforcing (Rodsetter)	47.41	33.10
Rigger & Machinery Mover	43.72	32.47
<b>LABORER</b>		
Journeyman Class One	35.20	26.82
Journeyman Class Two	35.30	26.82
Journeyman Class Three	35.35	26.82
Journeyman Class Four	35.50	26.82
Journeyman Class Five	35.60	26.82
Journeyman Class Six	35.34	26.82
Journeyman Class Seven	36.45	26.82

KINGESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

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PREVAILING WAGE RATES

Prevailing Wage Schedule (Effective 01042023 Revised)  
 Building Construction (cont'd)

<b>Journeyman Class Eight</b>	<b>36.50</b>	<b>26.82</b>
<b>Journeyman Class Nine</b>	<b>36.60</b>	<b>26.82</b>
<b>Journeyman Class Ten</b>	<b>36.75</b>	<b>26.82</b>
<b>Journeyman Class Eleven</b>	<b>37.00</b>	<b>26.82</b>
<b>Journeyman Class Twelve</b>	<b>35.57</b>	<b>26.82</b>
<b>LABORER: ASBESTOS ABATEMENT, LEAD ABATEMENT, TOXIC WASTE HANDLING, HAZARDOUS WASTE HANDLING</b>		
<b>MASTER ABATEMENT TECHNICIAN</b>	<b>36.70</b>	<b>27.00</b>
<b>LANDSCAPE LABORER</b>		
<b>Class I</b>	<b>28.15</b>	<b>23.83</b>
<b>Class II</b>	<b>28.15</b>	<b>23.83</b>
<b>LATHER</b>	<b>49.50</b>	<b>29.46</b>
<b>LINE CONSTRUCTION</b>		
<b>Lineman</b>	<b>57.93</b>	<b>27.80</b>
(as of 5/30/2022)	59.17	29.00
(as of 5/29/2023)	60.48	30.25
(as of 6/03/2024)	62.07	31.36
<b>Winch Truck Operator</b>	<b>40.55</b>	<b>24.50</b>
(as of 5/30/2022)	41.42	25.45
(as of 5/29/2023)	42.34	26.40
(as of 6/03/2024)	43.45	27.18
<b>Ground hand</b>	<b>34.76</b>	<b>22.60</b>
(as of 5/30/22)	35.50	23.36
(as of 5/29/2023)	36.29	24.20
(as of 6/03/2024)	37.24	24.90
<b>Watch/Flag Person</b>	<b>24.77</b>	<b>19.31</b>
(as of 5/30/2022)	25.30	19.94
(as of 5/29/2023)	25.86	20.26
(as of 6/03/2024)	26.54	21.19
<b>MARBLE SETTER</b>	<b>45.90</b>	<b>32.20</b>
<b>MARBLE FINISHER</b>	<b>38.27</b>	<b>29.15</b>
<b>MILLWRIGHT</b>	<b>45.40</b>	<b>33.29</b>
<b>PAINTER</b>		
<b>Brush &amp; Roller</b>	<b>41.77</b>	<b>31.61</b>
<b>Spray, Steel, &amp; Swing</b>	<b>43.02</b>	<b>31.61</b>
<b>Bridges</b>	<b>58.98</b>	<b>30.93</b>
<b>PILEDRIVERMAN</b>	<b>43.73</b>	<b>38.14</b>
<b>(Diver)</b>	<b>52.48</b>	<b>38.14</b>
<b>(Diver Tender)</b>	<b>43.73</b>	<b>38.14</b>

<b>PLASTERER</b>	<b>41.97</b>	<b>32.40</b>
(as of 5/1/2023)	41.97	33.65
(as of 5/1/2024)	41.97	34.90
<b>PLUMBER</b>	<b>62.73</b>	<b>36.61</b>
<b>POINTER, CAULKER, &amp; CLEANER</b>	<b>47.75</b>	<b>29.95</b>
<b>POWER EQUIPMENT OPERATOR</b>		

<b>Group One</b>	<b>51.04</b>	<b>31.97</b>
<b>Group One A</b>	<b>54.05</b>	<b>32.85</b>
<b>Group Two</b>	<b>50.79</b>	<b>31.90</b>
<b>Group Two A</b>	<b>53.81</b>	<b>32.77</b>
<b>Group Three</b>	<b>46.71</b>	<b>30.69</b>
<b>Group Four</b>	<b>46.41</b>	<b>30.60</b>
<b>Group Five</b>	<b>44.69</b>	<b>30.09</b>
<b>Group Six</b>	<b>43.70</b>	<b>29.80</b>

**\*\*\*TOXIC/HAZARDOUS WASTE REMOVAL\*\*\***

**Add 20 percent to basic hourly rate for all classifications**

<b>ROOFER</b>	<b>41.48</b>	<b>33.87</b>
<b>Shingle</b>	<b>31.25</b>	<b>22.10</b>
<b>Slate &amp; Tile</b>	<b>34.25</b>	<b>22.10</b>
<b>SHEET METAL WORKER</b>	<b>55.75</b>	<b>47.28</b>
<b>(Sign Makers and Hangers)</b>	<b>25.03</b>	<b>21.41</b>
<b>SOFT FLOOR LAYER (Resilient Floor)</b>	<b>52.49</b>	<b>29.73</b>
<b>SPRINKLER FITTER</b>	<b>62.79</b>	<b>31.43</b>
<b>STEAM FITTER</b>	<b>64.57</b>	<b>40.58</b>
<b>STONE MASON</b>	<b>45.90</b>	<b>32.20</b>
<b>Surveying and Layout</b>		
<b>(Chief of Party)</b>	<b>56.93</b>	<b>29.46</b>
<b>(Instrument Person)</b>	<b>49.50</b>	<b>29.46</b>
<b>(Rodman)</b>	<b>24.75</b>	<b>21.06</b>
<b>TERRAZZO MECHANIC</b>	<b>48.81</b>	<b>29.46</b>
<b>TERRAZZO FINISHER (Grinder)</b>	<b>42.71</b>	<b>27.71</b>
<b>TERRAZZO FINISHER (Finisher)</b>	<b>42.44</b>	<b>27.71</b>
<b>TILE SETTER</b>	<b>48.81</b>	<b>29.46</b>
<b>TILE FINISHER</b>	<b>38.27</b>	<b>29.15</b>
<b>TRUCK DRIVER</b>		
<b>Journeyman Class I</b>	<b>34.1075</b>	<b>20.1875</b>
<b>Journeyman Class II</b>	<b>34.2075</b>	<b>20.1875</b>
<b>Journeyman Class III And Low Boy</b>	<b>34.4575</b>	<b>20.1875</b>
<b>WALL COVERER</b>	<b>42.15</b>	<b>31.61</b>
<b>WELDER - Rate for craft to which, welding work is incidental.</b>		
<b>WINDOW TINTER</b>	<b>24.97</b>	<b>12.38</b>

## **B. Job Classification Definitions: Building Construction,**

### **1. Laborer Classifications:**

**Class One:** Strip concrete, dismantle concrete, load, unload, handle and/or transport reinforced steel and steel mesh, carry lumber, handle miscellaneous building materials operate jack hammers, use paving breakers and other pneumatic tools, build scaffolds, perform raking, handle asphalt, perform spading and concrete pit work, perform grading, perform form

pinning or shorting, perform demolition work with exception of burners, lay conduits, lay ducts, perform sheathing or lagging, lay non-metallic pipe, perform caulking.

**Class Two:** Power Buggies, Burners on Demolition.

**Class Three:** Wagon drill operator (single)

**Class Four:** Powderman, wagon drill operator (multiple), perform circular caissons excavations, caisson groundman, perform underpinning excavation, perform laborers' work at depth of eight (8) feet or below.

**Class Five:** Caisson bottom worker.

**Class Six:** Yard worker.

**Class Seven:** Trackmen, Brakemen, Groutmen, Bottom Shaft Men, All Other Men in Free Air Tunnels.

**Class Eight:** Caisson Foreman

**Class Nine:** Miner Helper, Form Setters.

**Class Ten:** Miners Bore Driver, Blasters, Drillers, Pneumatic Shield Operator.

**Class Eleven:** Welders & Burners.

**Class Twelve:** Mason Tenders

### **Landscape Laborers:**

**Class I:** Landscape laborer

**Class II:** Farm tractor driver, hydro seeder, mulched nozzle worker, backhoe operator, bulldozer crawler type loader, tree crane operator.

**Laborer - Lather and Plasterer:** Wheel and/or hod carry any lather and plaster materials used by lathering and plastering contractors' build scaffolds; build runways; perform clean-up and removal of debris as covered by lathering and plastering contractor's contract; deliver any material used by lathering and plastering contractor, from curbside to building and back, unless motor vehicles are permitted to enter building with required materials; all mortar designated for use by plasterer shall be carried via wheel barrow or hod; all plastering and fire proofing machines, as well as guns and mixers requiring the assistance of a worker other than plasterer operator, shall be manned by helper (tender).

### **2. Truck driver classifications:**

**Class I:** Helper, stake body truck operator (single axle, dumpster).

**Class II:** Dump truck operator, tandem truck operator, batch truck operator, semi-trailer truck operator, agitator-mixer truck operator, dump Crete type vehicle operator, asphalt distributor, farm tractor operator (when tractor used to transport materials), stake body truck (tandem) operator.

**Class III:** Euclid type; off highway equipment back truck operator; belly dump truck operator; double-hitched equipment trailer operator; straddle carrier (Ross) operator; low-bed trailer truck operator.

### **3. Power Equipment Operator Classifications – Building**

#### **Group One:**

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

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PREVAILING WAGE RATES

Handling steel and stone in connection with erection Cranes doing hook work  
Any machines handling machinery  
Helicopters  
Concrete Pumps (building)

**Machines similar to above, including remote control equipment**

**Group One A:**

Handling steel and stone in connection with erection.  
Cranes doing hook work  
Any machines handling machinery  
Concrete Pumps (Building)  
High Rail/Burro Crane  
Rail Loader (Winch Boom Type)

All equipment in this group which previously received the hour in lieu of an oiler will receive Wage Group I (A). Equipment in this Wage Group that does not require an oiler.

**Machines similar to above, including remote control equipment**

**Group Two:**

All types of cranes  
All types of backhoes  
Cableways  
Draglines  
Keystones  
All types of shovels  
Derricks  
Pavers 21E and over  
Trenching machines  
Trench shovels  
Cable spinning machine  
Gradalls  
Front- end Loaders  
Boat Captain  
Hoist with Two Towers  
Building Hoists-double drum (unless used as a single drum)  
Pippin type backhoes  
Tandem scrapers  
Tower type crane operation erecting dismantling jumping or jacking  
Drills self-contained (Drillmaster type)  
Fork lift (20ft. and over)  
Motor Patrols (fine grade)  
Batch Plant with Mixer  
Caryalls, Scrapers, Tournapulls  
Roller (High Grade Finishing)  
Spreaders (Asphalt)  
Bulldozers and Tractors  
Mechanic-Welder  
Conveyor Loaders (Euclid-Type Wheel)  
Concrete Pumps (Heavy Highway)  
Milling Machine

Bobcat  
Side Boom  
Directional Boring Machines  
Vermeer Saw Type Machine (other than hand held)  
Tractor Mounted Hydro Axe  
Chipper with boom  
All Autograde and concrete finishing machines  
Bundle Pullers/Extractors (Tubular)  
**Machines similar to the above including remote control equipment**  
\*Surcharge

**Group Two (A):**

Crawler backhoes and Crawler gradalls over one (1) cubic yard factory rating  
Hydraulic backhoes over one (1) cubic yard factory rating  
Single person operation truck cranes 15 ton and over factory rating  
Cherry picker type machinery and equipment 15 ton and over factory rating, etc.  
Cranes doing hook work will be paid Wage Group I (A).  
All equipment in this Group which previously received the hour in lieu of an oiler will receive Wage Group II (A) including concrete pumps (Heavy/Highway).  
**Machines similar to the above including remote control equipment**  
\*Surcharge

**Group Three:**

Asphalt Plant Engineers  
Conveyors (except building conveyors)  
Well Driller  
Forklift Trucks of all types  
Ditch Witch (small trenchers)  
Motor Patrols  
Fine Grade machines  
Rollers  
Concrete Breaking Machines (Guillotine Only)  
Stump Grinder  
High or Low Pressure Boilers  
Building Hoist (single drum)  
Elevator Operator (New Construction)  
**Machines similar to above including remote control equipment**

**Group Four:**

Seamen Pulverizing Mixer  
Form Line Graders  
Farm Tractors  
Road Finishing Machines  
Concrete Spreaders (Heavy Highway)  
Power Broom (self-contained)  
Seed Spreader  
Grease Truck  
**Machines similar to the above including remote control equipment**

**Group Five:**

Compressors

Pumps  
Well pint pumps  
Conveyors (Building)  
Welding Machines  
Heaters  
Tireman, Power Equipment  
Maintenance Engineers (Power Boats)  
Miscellaneous Equipment  
Operator  
Elevator Operator (Renovations)  
House Car  
Machines similar to above including remote control equipment

**Group Six:**

Fireman  
Oilers and Deck Hands (Personnel Boats)/Grease Truck Helpers  
\*Surcharge

**Group Seven (A):**

Handling steel and stone in connection with erection  
Cranes doing hook work  
Any machines handling machinery  
Cable spinning machine  
*Helicopters*  
*Concrete pumps (Building)*  
High Rail/Burro Crane  
Rail Loader (Winch Boom Type)  
Machines similar to above, including remote control equipment

**Group Seven B**

All types of cranes  
All types of backhoes  
Cableways  
Conveyor Loader (Euclid-Type Wheel)  
Drag Lines  
Keystones  
All types of shovels  
Derricks  
Pavers 21E and over  
Trench shovels  
Trenching machines  
Gradalls  
Front-end Loaders  
Boat Captain  
Hoist with two towers  
Concrete Pumps (Heavy, Highway)  
Building Hoists-double drum (unless used as a single drum)  
Milling Machine  
Mucking Machines in Tunnel  
Pippin type backhoes

Prevailing Wage Schedule (Effective 01042023 Revised)  
Building Construction (cont'd)

Bobcat  
Tandem scrapers  
Side Boom  
Tower type crane—operation, erecting, dismantling,  
Jumping or jacking  
Directional Boring Machines  
Vermeer Saw Type Machine (other than hand held)  
Drills self-contained (Drillmaster type)  
Fork Lift (20 ft. & over)  
Track or Mounted Hydro Axe  
Motor Patrols (Fine Grade)  
Chipper with boom  
Batch Plant with Mixer  
All autograde and concrete finishing machines  
Carryalls, Scapers & Tournapulls  
Rollers (High Grade Finishing)  
Bundle Pullers/Extractors (Tubular)  
Spreaders (Asphalt)  
Bulldozers and Tractors  
Mechanic – Welders  
Production Switch Tamper  
Ballast Regulators  
Tie Replacer  
Rail/Road Loader  
Power Jack liner  
Machines similar to above, including remote control equipment



**II. HEAVY AND HIGHWAY CONSTRUCTION**

**A. JOB CLASSIFICATION AND WAGE RATES**

	Basic Hourly Rate	Fringe Benefits
<b>BOILERMAKER</b>	50.17	35.30
<b>CARPENTER</b>	50.75	29.46
<b>CEMENT MASON</b>	42.05	33.46
(as of 5/1/2023)	42.70	33.41
(as of 5/1/2024)	44.25	33.41
(as of 5/1/2025)	45.80	33.41
(as of 5/1/2026)	47.40	33.41
<b>ELECTRICIAN</b>	65.76	43.48
<b>IRONWORKERS</b>		
Structural & Ornamental	47.70	39.16
Reinforcing (Rodsetter)	47.41	33.10
Rigger & Machinery Mover	43.72	32.47
<b>LABORERS</b>		
Group One	36.30	27.20
Group Two	36.50	27.20
Group Three	36.50	27.20
Group Four	31.10	27.20
Group Five	37.15	27.20
Group Six	37.20	27.20
Group Seven	37.05	27.20
Group Eight	36.80	27.20
Group Nine	36.65	27.20
Group Ten	36.80	27.20
Group Eleven	36.70	27.20
Group Twelve	38.40	27.20
Group Thirteen	40.43	27.20
Group Fourteen	36.55	27.20
<b>LANDSCAPING LABORER</b>		
Class I	27.73	23.65
Class II	27.73	23.65
<b>LINE CONSTRUCTION</b>		
<b>Lineman</b>	57.93	27.80
(as of 5/30/2022)	59.17	29.00
(as of 5/29/2023)	60.48	30.25
(as of 6/03/2024)	62.07	31.36
<b>Winch Truck Operator</b>	40.55	24.50
(as of 5/30/2022)	41.42	25.45
(as of 5/29/2023)	42.34	26.40
(as of 6/03/2024)	43.45	27.18
<b>Ground hand</b>	34.76	22.60
(as of 5/30/22)	35.50	23.36
(as of 5/29/2023)	36.29	24.20
(as of 6/03/2024)	37.24	24.90

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

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PREVAILING WAGE RATES

Prevailing Wage Schedule (Effective 01042023 Revised)  
 Building Construction (cont'd)

<b>Watch/Flag Person</b>	<b>24.77</b>	<b>19.31</b>
(as of 5/30/2022)	<b>25.30</b>	<b>19.94</b>
(as of 5/29/2023)	<b>25.86</b>	<b>20.26</b>
(as of 6/03/2024)	<b>26.54</b>	<b>21.19</b>
<b>MILLWRIGHT</b>	<b>45.30</b>	<b>33.29</b>
<b>PAINTERS</b>		
<b>Brush &amp; Roller</b>	<b>41.77</b>	<b>31.61</b>
<b>Spray, Steel, &amp; Swing</b>	<b>43.02</b>	<b>31.61</b>
<b>Bridges</b>	<b>58.98</b>	<b>30.93</b>
<b>POWER EQUIPMENT OPERATOR</b>		
<b>Group One</b>	<b>51.04</b>	<b>31.97</b>
<b>Group One A</b>	<b>54.05</b>	<b>32.85</b>
<b>Group Two</b>	<b>50.79</b>	<b>31.90</b>
<b>Group Two A</b>	<b>53.81</b>	<b>32.77</b>
<b>Group Three</b>	<b>46.71</b>	<b>30.69</b>
<b>Group Four</b>	<b>46.41</b>	<b>30.60</b>
<b>Group Five</b>	<b>44.69</b>	<b>30.09</b>
<b>Group Six</b>	<b>43.70</b>	<b>29.80</b>

**\*\*\*TOXIC/HAZARDOUS WASTE REMOVAL\*\*\***  
**Add 20 percent to basic hourly rate for all classifications**

<b>POWER EQUIPMENT OPERATOR DREDGER</b>		
<b>Class A1</b>	<b>42.66</b>	<b>14.01</b>
<b>Class A2</b>	<b>38.02</b>	<b>13.73</b>
<b>Class B1</b>	<b>36.89</b>	<b>13.66</b>
<b>Class B2</b>	<b>34.73</b>	<b>13.53</b>
<b>Class C1</b>	<b>33.78</b>	<b>13.18</b>
<b>Class C2</b>	<b>32.69</b>	<b>13.11</b>
<b>Class D</b>	<b>27.16</b>	<b>12.58</b>
<b>PILEDRIVERMAN</b>	<b>43.73</b>	<b>38.14</b>
<b>(Diver)</b>	<b>52.48</b>	<b>38.14</b>
<b>(Diver Tender)</b>	<b>43.73</b>	<b>38.14</b>
<b>STEAM FITTER</b>	<b>62.32</b>	<b>39.04</b>
<b>STONE MASON</b>	<b>44.90</b>	<b>30.75</b>
<b>Surveying and Layout</b>		
<b>(Chief of Party)</b>	<b>58.47</b>	<b>28.96</b>
<b>(Instrument Person)</b>	<b>50.84</b>	<b>28.96</b>
<b>(Rodman)</b>	<b>40.67</b>	<b>22.31</b>
<b>TRUCK DRIVER</b>		
<b>Class I</b>	<b>34.1075</b>	<b>20.1875</b>
<b>Class II</b>	<b>34.2075</b>	<b>20.1875</b>
<b>Class III</b>	<b>34.4575</b>	<b>20.1875</b>

**B. Job Classification Definitions: Heavy and Highway Construction**

**1. Laborer Classifications:**

**Group One:** Yard workers: (laborer, scale mixerman, burnerman, dustman, feeder)

**Group Two:** General laborer; Asphalt Shovelers; Sheeting, Shoring & Lagging – Laborer; Stone, Granite & Artificial Stone Setting Laborer; Hod Carriers; Scaffold Building; Relief Joint & Approach Slabs; Assembling & Placing Gabions; Pneumatic Tool Laborers; Concrete Forms & Stripping Laborers; Concrete Lumber Material Laborers; Steel & Steel Mesh (carrying & handling); Form Pinner; Mortar Mixers; Pouring & Placing Concrete; Grade Men.

**Group Three:** Vibrator Laborers; Finish Surface Asphalt Rakers; Jackhammer Operators; Paving Breaker Operator; Pipelayer & Caulker (all joints up to within 5 feet of the Building Foundation Line); Conduit & Duct Layers

**Group Four:** Flagperson

**Group Five:** Miners

**Group Six:** Welders and Burners.

**Group Seven:** Miner Bore Driver; Blasters; Drillers Pneumatic Shield Operator

**Group Eight:** Form Setters

**Group Nine:** Trackmen; Brackmen; Groutmen; Bottom Shaft Men; All other Laborers in Free Air Tunnels; Underpinning (When an underpinning excavation for a pier hole of five feet square or less and eight feet or more deep is dug, the rate shall apply only after a depth of eight feet is reached, to the men working in the bottom)

**Group Ten:** Circular Caissons (Where an excavation for circular caissons are dug eight feet or more below the natural grade level adjacent to the starting point of the caisson hole, at ground level, for the men working in the bottom); Welders, Burners & Air Tuggers

**Group Eleven:** Powdermen; Multiple Wagon Drill Operator Laborer

**Group Twelve:** Caisson Laborer Foreman

**Group Thirteen:** Toxic/Hazardous waste Handler

**Group Fourteen:** Wagon Drill/Hydraulic Track Drill Operator Laborer

**Landscape Laborers:**

**Class I:** Landscape laborer

**Class II:** Farm tractor driver, hydroseeder, mulcher nozzle worker, backhoe operator, bulldozer crawler type loader, tree crane operator.

**2. Power Equipment Operator Classifications - Heavy, & Highway**

**Group One:**

Handling steel and stone in connection with erection Cranes doing hook work

Any machines handling machinery

Cable spinning machine

Helicopters

Concrete Pumps (building)

Machines similar to above including remote control equipment

**Group One A:**

Handling steel and stone in connection with erection.

Cranes doing hook work

Any machines handling machinery

Concrete Pumps (Building)

High Rail/Burro Crane

Rail Loader (Winch Boom Type)

All equipment in this group which previously received the hour in lieu of an oiler will receive Wage Group I (A). Equipment in this Wage Group that does not require an oiler.

**Machines similar to above, including remote control equipment**

**Group Two:**

All types of cranes

All types of backhoes

Draglines

Keystones

All types of shovels

Derricks

Pavers 21E and over

Trenching machines

Trench shovels

Gradalls

Front- end Loaders

Boat Captain

Hoist with Two Towers

Building Hoists-double drum (unless used as a single drum)

Pippin type backhoes

Tandem scrapers

Tower type crane operation erecting dismantling jumping or jacking

Drills self-contained (Drillmaster type)

Fork lift (20ft. and over)

Motor Patrols (fine grade)

Batch Plant with Mixer

Carryalls, Scrapers, Tournapulls

Roller (High Grade Finishing)

Bulldozers and Tractors

Mechanic-Welder

Conveyor Loaders (Euclid-Type Wheel)

Concrete Pumps (Heavy Highway)

Milling Machine

Bobcat

Side Boom

Directional Boring Machines

Vermeer Saw Type Machine (other than hand held)

Tractor Mounted Hydro Axe

Chipper with boom

All Autograde and concrete finishing machines

Bundle Pullers/Extractors (Tubular)

**Machines similar to the above including remote control equipment**

**Group Two A:**

Crawler backhoes and Crawler gradalls over one (1) cubic yard factory rating

Hydraulic backhoes over one (1) cubic yard factory rating

Single person operation truck cranes 15 ton and over factory rating

Cherry picker type machinery and equipment 15 ton and over factory rating, etc.

Cranes doing hook work will be paid Wage Group I (A).  
All equipment in this Group which previously received the hour in lieu of an oiler will receive Wage Group II (A) including concrete pumps (Heavy/Highway).

**Machines similar to the above including remote control equipment**

**Group Three:**

Asphalt Plant Engineers  
Conveyors (except building conveyors)  
Well Drillers  
Forklift Trucks of all types  
Ditch Witch (small trenchers)  
Motor Patrols  
Fine Grade machines  
Rollers  
Concrete Breaking Machines (Guillotine Only)  
Stump Grinder  
High or Low Pressure Boilers  
Building Hoist (single drum)  
Elevator Operator (New Construction)

**Machines similar to above including remote control equipment**

**Group Four:**

Seamen Pulverizing Mixer  
Form Line Graders  
Farm Tractors  
Road Finishing Machines  
Concrete Spreaders (Heavy Highway)  
Power Broom (self-contained)  
Seed Spreader  
Grease Truck

**Machines similar to the above including remote control equipment**

**Group Five:**

CompressorsPumps  
Well pint pumps  
Conveyors (Building)  
Welding Machines  
Heaters  
Tireman, Power Equipment  
Maintenance Engineers (Power Boats)  
Miscellaneous Equipment Operator  
Elevator Operator (Renovations)  
House Car

**Machines similar to above including remote control equipment**

**Group Six:**

Fireman  
Oilers and Deck Hands (Personnel Boats)  
Grease Truck Helpers

**Group Seven A:**

Handling steel and stone in connection with erection

Cranes doing hook work  
Any machines handling machinery  
Cable spinning machinery  
Helicopters  
Concrete pumps (Building)  
High Rail/Burro Crane  
Rail Loader (Winch Boom Type)  
**Machines similar to above, including remote control equipment**

**Group Seven B:**

All types of cranes  
All types of backhoes  
Cableways  
Conveyor Loader (Euclid-Type Wheel)  
Drag Lines  
Keystones  
All types of shovels  
Derricks  
Pavers 21E and over  
Trench shovels  
Trenching machines  
Gradalls  
Front-end Loaders  
Boat Captain  
Hoist with two towers  
Concrete Pumps (Heavy, Highway)  
Building Hoists-double drum (unless used as a single drum)  
Milling Machine  
Mucking Machines in Tunnel  
Pippin type backhoes  
Bobcat  
Tandem scrapers  
Side Boom  
Tower type crane operation, erecting, dismantling,  
Jumping or jacking  
Directional Boring Machines  
Vermeer Saw Type Machine (other than hand held)  
Drills self-contained (Drillmaster type)  
Fork Lift (20 ft & over)  
Tractor Mounted Hydro Axe  
Motor Patrols (Fine Grade)  
Chipper with boom  
Batch Plant with Mixer  
All autograde and concrete finishing machines  
Caryalls, Scapers & Tournapulls  
Rollers (High Grade Finishing)  
Bundle Pullers/Extractors (Tubular)  
Spreaders (Asphalt)

Bulldozers and Tractors  
Mechanic – Welders  
Production Switch Tamper  
Ballast Regulators  
Tie Replacer  
Rail/Road Loader  
Power Jack liner  
**Machines similar to above, including remote control equipment**

\*Surcharge

**Power Equipment Operator Dredger Classifications**

**Class A:** Lead Dredgeman, Operator, Leverman, Licensed Tug Operator over 1000HP.

**Class A1:** Dozer Operator, Front-end Loader.

**Class B1:** Derrick Operator, Spider/Spill Barge Operator, Engineer, Electrician, Chief welder Chief Mate, Fill Placer, Operator 2, Maintenance Engineer, Licensed Boat Operator.

**Class B2:** Certified Welder.

**Class C1:** Mate, Drag Barge Operator, Steward, Assistant Fill Placer, Welder.

**Class C2:** Boat Operator.

**Class D:** Shoreman, Deckhand, Rodman, Scowman, Cook, Messman, Porter/Janitor, Oiler.

**3. Truck Driver Classifications:**

**Class I:** Helper, stake body truck operator (single axle, dumpster)

**Class II:** Dump truck operator, tandem truck operator, batch truck operator, semi-trailer truck operator, agitator-mixer truck operator, dumpcrete type vehicle operator, asphalt distributor, farm tractor operator (when used to transport materials), stake body truck (tandem) operator.

**Class III:** Euclid type, off highway equipment back truck operator, belly dump truck operator, double-hitched equipment trailer operator, straddle carrier (Ross) operator; lowbed trailer truck operator.

**NOTE:**

1. Contractors are advised to contact the Philadelphia Labor Standards Unit with any questions regarding job classification, prevailing wage rates, and fringe benefits.
2. Prior to employing apprentices on a public works project, the contractor is required to provide written evidence of employee's registration with a statewide training program recognized by the U.S. Bureau of Apprenticeship and Training (BAT). Contractors shall forward proper documentation for each bona fide apprentice to:

**Philadelphia Labor Standards Unit  
Municipal Services Building  
1401 John F. Kennedy Boulevard – 1st Floor, Room 170C  
Philadelphia, PA 19102-1670  
Telephone Number: (215) 686-2132  
Fax Number: (215) 686-2116**



Prevailing Wage Schedule (Effective 01042023 Revised)  
Building Construction (cont'd)

## SECTION 01 1200 SUMMARY OF THE WORK

### PART 1—GENERAL

#### 1.1 DESCRIPTION OF WORK

- A. This Section summarizes construction operations required by the Contract Documents, defines aspects of Prime Contractor's relationship with City and lists special City requirements.

#### 1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

#### 1.3 PROJECT DESCRIPTION

- A. The work includes:
1. Interior renovations including: repairs to walls, ceilings, woodwork ; enlarged spaces and new finishes, new doors and frames,, signage,
  2. Accessibility upgrades including elevator, lifts, and accessible toilet rooms;
  3. New mechanical, electrical, plumbing, fire protection, telecom and security systems
  4. New sprinkler system;
  5. Site upgrades including an artificial turf field, improved stormwater management, new playground with safety surface and accessible play equipment, improved internal pathways, fence repairs, lighting, and security, gathering space and amenities, additional plantings, and improvements to surface of courts.
- B. The exterior envelope, Package 1, which includes roof replacement, new roof dormers, new windows, new exterior doors (except main entry), masonry cleaning and repair, and demolition of utilities required for the exterior envelope work, is under separate contract.
1. See Drawing G101-R.2 for detailed description of interface and coordination between Package 1 and Package 2 scope of work, including:
    - a. Roof – new interior beadboard, new dormer louvers and interior trim, painting,
    - b. Windows –Package 1 Contractor to install exterior windows, seal inside and outside. Contractor to install Interior trim at windows and finish.
    - c. Doors – Package 1 Contractor to provide temporary construction doors at select egress doors and leave in place for Package 2 Contractor.
    - d. Catwalk – Contractor to temporarily remove insulation installed in Package 1, provide additional framing to elevate catwalk, and reinstall insulation.
    - e. See drawings for graphic delineation of Package 1 and 2
  2. Package 1 contract duration is 150 consecutive calendar days.  
Contractor to coordinate with Package 1 Contractor for site and building access, laydown and trailer space, etc.
- C. Kingsessing Recreation Center Building and Site Improvements is located at 4901 Kingsessing Ave, Philadelphia, PA 19143.

For complete scope of work please refer to the Project Drawings and the Specifications. This project is part of the City's Rebuilding Community Infrastructure Program ("Rebuild").

#### 1.4 CONTRACTS

- A. Construct Work under a Single Prime Contract for all Construction Work.
  - 1. The Contractor shall coordinate the work of all Subcontractors.
  
- B. General Construction Work: Provide all the Work of the Contract, no matter where the information is located.
  - 1. Provide a dumpster for the use of all SubContractors.
  - 2. Provide periodic and final cleaning of building and site.
  - 3. Provide temporary site perimeter fence and sidewalk cover if required.
  - 4. Provide temporary toilet facilities for all Sub Contractors.
  - 5. Provide painting of all surfaces and equipment exposed to view in the finished Work.
  
- C. Contractor will also be responsible for Moving, storage, and return to facility of property including but not limited to:
  - 1. Boxes, sports and recreational equipment, maintenance equipment, appliances, and furniture. Type and quantity of items to be finalized prior to commencement of work.
  - 2. Bidder to provide an inventory of all items including quantity and condition to owner immediately after completing the move.
  - 3. Bidder to return all items in like condition immediately following issuance of Certificate of Substantial Completion.
  - 4. Bidders may propose to move items to an off-site secure (insured) location or provide a secure area on-site during construction for the storage of items, or propose a combination of on and off-site storage.
  - 5. Payment for moving and storage will be based on final inventory and invoices.
  
- D. Construction Sequencing
  - 1. The pool is to be opened for the 2024 season. The contractor is to schedule work to complete all elements required to allow safe operation of the pool, access to the pool, and egress from the pool. This includes, but is not limited to:
    - a. Repairs to the pool site wall: pointing, reconstruction at the southeast corner, and other crack repair as described on the drawings;
    - b. New pool egress ramp and gate (South side);
    - c. New pool entrance gate (North side);
    - d. Protected public access way from street to entry and from exits to public way;
    - e. All equipment, fixtures, finishes, MEP systems required for new toilet rooms Women's Toilet Rm 010 and Men's Toilet Rm 013 to be operational;
    - f. All services related to pool operation and maintenance such as water supply, power supply, and filter room and chlorine storage tank operations and access;

- g. Pool schedule is not currently known; allow for 3 months June 1 through August 31.

2.

1.5 CONTRACTOR'S USE OF PREMISES

- A. Contractors shall have complete and exclusive use of premises as required for execution of Work of this Contract only.
- B. Coordinate use of premises with Project Coordinator.
- C. Protect products stored on-site.
- ~~D.~~ Store products to avoid interference with operations of City.
- E. Secure and pay for additional storage and work areas if required by Contractor.
- F. Do not overload structure with stored materials.

END OF SECTION

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SECTION 01 2100  
ALLOWANCES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies each Prime Contractor's administrative and procedural requirements governing handling and processing allowances

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Each section of the specifications including an allowance.

1.3 COORDINATION

- A. Designate required selection and delivery dates for products under each allowance in the Contractor's Construction Schedule.
- B. Designate each allowance with extensions based on estimated quantities for unit price allowances on Contractor's Schedule of Values.

1.4 DEFINITIONS

- A. Refer to Section 007200.

1.5 ALLOWANCES

- A. Include in Total Base Bid Amount, an amount equal to Two Percent (2%) of the base bid amount for payment of permit fees. This is a direct cost; no mark-ups will be permitted.
- B. Include in Total Base Bid Amount, an amount equal to \$30,000 for new site signage as per PPR standards.
- C. Include in Total Base Bid Amount, an amount equal to \$25,000 (twenty-five thousand dollars) for Moving and Storage scope. Refer to 011000 "Summary".
- D. Include in Total Base Bid Amount, an amount equal to \$50,000 (fifty thousand dollars) for site security as per PPR standards.
- E. Include in Total Base Bid Amount, an amount equal to \$\_\_\_\_\_ (TBD dollars) for Unforeseen Coordination issues that may arise between Package 1 and Package 2 contract.
- F. Amount of each allowance (excluding 1.5.A above) shall include:
  - 1. Net cost of product.
  - 2. Delivery to site.
  - 3. Applicable taxes.
  - 4. Preparing submittals.
- G. In addition to amounts of allowances (excluding 1.5.A above), include in the base bid amount, the Contractor's cost for:
  - 1. Assisting in selection and obtaining proposals from suppliers and subcontractors.
  - 2. Processing submittals.

3. Handling at site, including unloading, uncrating and storage.
4. Protection from elements and from damage.
5. Labor, installation and finishing.
6. Other expenses required to complete installation.
7. Overhead and profit.

1.6 SELECTION OF PRODUCTS

- A. Design Professional shall issue by Change Order a full specification for the final selected product.
- B. Contractor's Duties
  1. Notify Design Professional of deadlines for specification of final products, allowing for Contractor's required submissions as required to meet Date of Completion.
  2. Provide cost proposals for products being considered when requested by Design Professional.
  3. Notify Design Professional of any effect anticipated by selection of product or supplier under consideration as it relates to:
    - a. Construction Schedule.
    - b. Contract Sum.
    - c. On notification of selection, enter into purchase agreement with designated supplier.

1.7 INSTALLATION

- A. Comply with requirements of applicable specification section, including warranties/guarantees.

1.8 ADJUSTMENT OF COSTS

- A. Should actual purchase cost be more or less than specified amount of allowance, Contract Sum shall be adjusted by Change Order equal to amount of difference. A percentage to cover Contractor's overhead and profit, as stated in Standard Contract Requirements, will be applied to difference in cost.
- B. For products specified under unit cost allowance unit cost applies to quantity required to complete the Work as determined by the Contractor.
  1. Submit invoices or other data to substantiate quantity actually used.
- C. Submit request for other costs, claimed for additional work caused by increase over amount of allowance, prior to required submission for product.

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION                    Not Used

- END -

## SECTION 01 2200 UNIT PRICES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.
- C. Defect assessment and non-payment for rejected work.

#### 1.02 RELATED REQUIREMENTS

- A. Document 00 2113 - Instructions to Bidders: Instructions for preparation of pricing for Unit Prices.
- B. Document 00 4322 - Unit Prices Form: List of Unit Prices as supplement to Bid Form
- C. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

#### 1.03 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

#### 1.04 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

#### 1.05 MEASUREMENT OF QUANTITIES

- A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.
- B. Owner will take all measurements and compute quantities accordingly.
- C. Assist by providing necessary equipment, workers, and survey personnel as required.
- D. Measurement Devices:
  - 1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
  - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.

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UNIT PRICES



3. Metering Devices: Inspected, tested and certified by the applicable state department within the past year.
- E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
- F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
- G. Measurement by Area: Measured by square dimension using mean length and width or radius.
- H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
- I. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.
- J. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.
- K. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

#### 1.06 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- B. Payment will not be made for any of the following:
  1. Products wasted or disposed of in a manner that is not acceptable.
  2. Products determined as unacceptable before or after placement.
  3. Products not completely unloaded from the transporting vehicle.
  4. Products placed beyond the lines and levels of the required Work.
  5. Products remaining on hand after completion of the Work.
  6. Loading, hauling, and disposing of rejected Products.

#### 1.07 DEFECT ASSESSMENT

- A. Replace Work, or portions of the Work, not complying with specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct one of the following remedies:
  1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Architect.
  2. The defective Work will be partially repaired to the instructions of the Architect, and the unit price will be adjusted to a new unit price at the discretion of Architect.
- C. If, in the opinion of Owner, it is not practical to remove and replace the Work, Owner will direct one of the following remedies:
  1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Owner.

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS - PACKAGE #2

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UNIT PRICES

2. The defective Work will be partially repaired to the instructions of the Owner, and the unit price will be adjusted to a new unit price at the discretion of Owner.
- D. The individual specification sections may modify these options or may identify a specific formula or percentage price reduction.
- E. The authority of Owner to assess the defect and identify payment adjustment is final.

#### 1.08 SCHEDULE OF UNIT PRICES

- A. Unit Price No. 1: Repair of plaster – level 1 repair
  1. Description: Hairline cracks, small holes/bubbles:
    - a. clean joint or area, apply joint compound & mesh, sand / prep for scheduled finishes
  2. Section 092400 "CEMENT PLASTERING"
  3. Unit of Measurement: Square foot of damage.
- B. Unit Price No. 2: Repair of plaster – level 2 repair
  1. Description: Large cracks, loose plaster, water damage
    - a. Remove loose plaster back to solid material; apply 3-coat plaster system, finish as scheduled.
  2. Section 092400 "CEMENT PLASTERING"
  3. Unit of Measurement: Square foot of damage.
- C. Unit Price No. 3: New openings in masonry walls
  1. Description: Provide opening and steel lintel per structural dwgs.
  2. Unit of Measurement: Square foot of opening.
- D. Unit Price No. 4: New furring over masonry walls
  1. Description: metal stud wall and 5/8" abuse-resistant GWB, installed full height to underside of structure.
  2. Section 092500 GYPSUM BOARD; 092216 NON-STRUCTURAL METAL FAMING
  3. Unit of Measurement: Square foot of wall
- E. Unit Price No. 5: Wood Floor repair
  1. Description: Repair of wood floors at gyms, and 2<sup>nd</sup> floor
  2. Section 062000 FINISH CARPENTRY
  3. Unit of Measurement: Square foot of surface.
- F. Unit Price No. 6: Underlayment
  1. Description: Provide new underlayment; remove deteriorated underlayment and install new.
  2. Section 062000 "FINSH CARPENTRY"
  3. Unit of Measurement: Square foot of surface.
- G. Unit Price No. 7: Brick Replacement – Site wall and at select areas indicated on drawings.
  1. Description: Remove damaged brick and replace with new matching brick according to:
  2. Section 040101 "REPAIR AND CLEANING OF EXISTING MASONRY"
  3. Unit of Measurement: Each brick replaced.
- H. Unit Price No. 8: Crack and spall repair - Brick – Site wall

1. Description: Repairs per detail 1/S304-R.2
  2. Section 040101 "REPAIR AND CLEANING OF EXISTING MASONRY"
  3. Unit of Measurement: Lineal foot of crack.
- I. Unit Price No. 9: Mortar joint crack repair - Brick – Site wall
1. Description: Repairs per detail 2/S304-R.2
  2. Section 040101 "REPAIR AND CLEANING OF EXISTING MASONRY"
  3. Unit of Measurement: Lineal foot of crack.
- J. Unit Price No. 10: Dutchman repair – Limestone
1. Description: Remove damaged stone and replace with new limestone dutchman with profiled and flat surfaces to match existing limestone according to the following Section and as indicated on structural Drawings.
  2. Section 040101 "REPAIR AND CLEANING OF EXISTING MASONRY"
  3. Unit of Measurement: Square foot of dutchman repair.
- K. Unit Price No. 11: Dutchman repair – Granite.
1. Description: Remove damaged stone and replace with new Granite dutchman with profiled and flat surfaces to match existing Granite according to the following Section and as indicated on structural Drawings.
  2. Section 040101 "REPAIR AND CLEANING OF EXISTING MASONRY"
  3. Unit of Measurement: Square foot of dutchman repair.
- L. Unit Price No. 12: Repair of cracks with composite patching material – Granite.
1. Description: Cut out material in surface crack and apply composite patching material and crushed granite to fill crack and shed water away from surface of building according to:
  2. Section 040101 "REPAIR AND CLEANING OF EXISTING MASONRY"
  3. Unit of Measurement: Lineal foot of crack repaired.
- M. Unit Price No. 13: Repair of cracks with composite patching material – Granite.
1. Description: Cut out material in surface crack and apply composite patching material and crushed granite to fill crack and shed water away from surface of building according to:
  2. Section 040101 "REPAIR AND CLEANING OF EXISTING MASONRY"
  3. Unit of Measurement: Lineal foot of crack repaired.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2200

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS - PACKAGE #2

01 2200 - 4

UNIT PRICES

## SECTION 01 2300 ALTERNATES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Description of Alternates.
- B. Procedures for pricing Alternates.
- C. Documentation of changes to Contract Price and Contract Time.

#### 1.02 RELATED REQUIREMENTS

- A. Document 00 4323 - Alternates Form: List of Alternates as supplement to Bid Form.

#### 1.03 ACCEPTANCE OF Alternates

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.
- C. Note: Select Alternates require select items to be priced separately.

#### 1.04 SCHEDULE OF Alternates

- A. The following enumeration represents the general intent of base bid and alternate scope and is not meant to be all-inclusive. See also drawings and specifications.
- B. Alternate No. R1: DEDUCT ALT - Architectural Reductions (Lower Level)
  - 1. Base Bid: Interior renovations at the Lower Level per Package 2 set,
  - 2. Alternate (Deduct): See also drawing AD101B-R.2, A101B-R.2; Respective MEP/FP/IT drawings
    - a. Architectural: Reduction of scope at Lower Level (LL) as shown on drawings:
      - 1) Areas that are hatched – remove from scope all architectural work, except as specifically noted otherwise. See graphic key on drawings.
      - 2) Areas shown without hatch and encircled with dotted line – renovate as described on base scope drawings. See graphic key on drawings.
      - 3) Do not demolish existing walls except as required for (LL) restrooms and elevator modifications.
    - b. Elec: Provide new lighting only at areas to be renovated and at stairs and as needed for egress/exits. See Electrical drawings.
    - c. Fire Alarm: Provide work only at areas to be renovated and at stairs. See FA drawings.
    - d. Mech: No change from Base Bid. See Mech. drawings.
    - e. Plumb: No change from Base Bid. See Plumbing drawings.
    - f. Fire Protection: No change from Base Bid. See Fire Protection drawings.
    - g. Telecom: No change from Base Bid. See Telecom drawings.

- C. Alternate No. R2: ADD ALT – Additional scope at Lower Level
1. Base Bid: Interior renovations at the Lower Level per Package 2 set
  2. Alternate (Add): See also drawing AD101C-R.2, A101C-R.2; Respective MEP/FP/IT drawings per Base Bid.
    - a. Full renovation of lower level:
    - b. Architectural: In addition to walls to be removed in Base Bid, remove walls at lower level as shown on drawings and provide new walls as noted to create reconfigured spaces:
      - 1) New single use toilet room at Locker Area.
      - 2) Enlarged Multi-space 034
      - 3) Reduced Telecom Rm 028
      - 4) See Scope of Work notes on Demolition and New Work on drawings.
    - c. Elec: Same as base scope except as needed to accommodate new reconfigured spaces
    - d. Mech: Same as base scope except as needed to accommodate new reconfigured spaces
    - e. Plumbing: Same as base scope except as needed to accommodate new reconfigured spaces
    - f. Fire Protection: Same as base scope except as needed to accommodate new reconfigured spaces
    - g. Telecom: Same as base scope except as needed to accommodate new reconfigured spaces
- D. Alternate No. R3: ADD ALT – New stage lighting
1. Base Bid: existing lighting to remain
  2. Alternate(Deduct): Remove existing lighting, install new light fixtures as scheduled.
- E. Alternate No. R4: ADD ALT – New stage curtains
1. Base Bid: Existing curtains to remain. GC to remove, clean, repair and reinstall curtains.
  2. Alternate (Add): Remove existing curtains; Provide and install new curtains.
- F. Alternate No. S1: Playing Fields
1. Base Bid: Artificial turf field including underground storm-water management.
  2. Alternate (Deduct): Provide Natural Turf Field; reduce storm basin by 50%
- G. Alternate No. S2: Rec Center Frontage Paving
1. Base Bid:
    - a. New concrete vehicular paving – extent as indicated on drawings
    - b. Repairs to existing brick paving – extent as indicated on drawings
  2. Alternate (Deduct):
    - a. Provide asphalt vehicular paving in lieu of concrete
- H. Alternate No. S3: Tennis Courts
1. Base Bid: No Scope
  2. Alternate (Add):
    - a. Color coating and white line striping only.
- I. Alternate No. S4: Diagonal path from 51<sup>st</sup> and Chester to playground
1. Base Bid:
    - a. Diagonal Vehicular path: concrete paving
    - b. Lighting: Install (5) PPR Standard pedestrian light posts

2. Alternate (Add):
  - a. Install concrete pads, PPR Standard backless benches – (3) location as shown on landscape drawing L800-R.2
  - b. Trash (1) and recycling (1) receptacles
  - c. Install (5) Canopy trees
  
- J. Alternate No S5: Scoreboard
  1. Base Bid:
    - a. Power to location shown on Civil drawing C172-R.2 for scoreboard
  2. Alternate (Add)
    - a. Furnish and install scoreboard.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2300

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SECTION 01 2500  
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies each Prime Contractor's administrative and procedural requirements for handling requests for substitutions made after award of the Contract. Procedural requirements governing the Contractor's selection of products and product options are included under Section 016001 "Products and Materials".

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.
- B. Substitutions - Requests for changes in products, materials, equipment, and construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions". The following shall not be considered substitutions:
  - 1. Substitutions requested by Bidders during the bidding period, and accepted in Addenda prior to award of Contract.
  - 2. Revisions to Contract Documents requested by the City or Design Professional.
  - 3. Specified options of products and construction methods included in Contract Documents.
  - 4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.
- C. "Or equal", "or equivalent", "approved equal", "approved equivalent", "equivalent substitution" and all other similar terms shall be interpreted as "substitution" as defined above.

1.4 SUBMITTALS

- A. Submit three (3) copies of each request for substitution. Submit requests with the form attached at the end of this Section and in accordance with procedures required for Change Order proposals. Attach all other data and certification.
- B. Identify the product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate.
- C. Product Data, including Drawings and descriptions of products, fabrication and installation procedures.
- D. Samples, where applicable or requested.
- E. A detailed comparison of salient features and qualities of the proposed substitution with those of the Work specified. Salient features and qualities may include elements such as size, weight, durability, performance, and visual effect



as determined by the Design Professional. Submit documentation of salient features and qualities from independent testing agencies performing industry recognized tests. The manufacturer's claims of performance may or may not be used in evaluation of substitutions at the discretion of the Design Professional.

- F. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the City and separate Contractors, that will become necessary to accommodate the proposed substitution.
- G. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
- H. Cost information, including a proposal of the net change, if any in the Contract Sum. The Contractor shall certify that the cost data presented is complete and includes all related costs under this Contract, but excludes the Design Professional's redesign costs.
- I. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.
- J. Certification that the Contractor will reimburse the City for all costs for additional services by the Design Professional and/or the Department of Parks & Recreation relating to any substitution that necessitates a design change and related documentation.
- K. Design Professional's Action - The Design Professional will notify the Contractor of acceptance or rejection of the proposed substitution. The Design Professional will be the sole judge of the acceptability of the proposed substitution. Acceptance will be in the form of a Change Order. The Change Order will include a deduction from the Contract Sum for additional costs incurred by the City because of the substitution including, but not limited to, Design Professional's fees.

## PART 2 PRODUCTS

### 2.1 SUBSTITUTIONS

- A. Conditions - The Contractor's substitution request will be received and considered by the Design Professional when one or more of the following conditions are satisfied, as determined by the Design Professional; otherwise requests will be returned without action except to record noncompliance with these requirements.
  - 1. Extensive revisions to Contract Documents are not required.
  - 2. Proposed changes are in keeping with the general intent of Contract Documents.
  - 3. The request is timely, fully documented and properly submitted.
  - 4. The request is directly related to an "or approved substitution" clause or similar language in the Contract Documents.
  - 5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the

product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.

6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
  7. A substantial advantage is offered the City, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the City may be required to bear. Additional responsibilities for the City may include additional compensation to the Design Professional for redesign and evaluation services, increased cost of other construction by the City or separate Contractors, and similar considerations.
- B. The specified product or construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
  - C. The specified product or construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
  - D. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.
  - E. Where a proposed substitution involves more than one Prime Contractor, each Contractor shall cooperate with the other Contractors involved to coordinate the Work, provide uniformity and consistency, and to assure compatibility of products.
  - F. The Contractor's submittal and Design Professional acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 EXECUTION                      Not Applicable

Attachment - Substitution Request Form (4 pages)

- END -

CITY OF PHILADELPHIA SUBSTITUTION REQUEST FORM

INSTRUCTIONS:

- A. This request must be submitted and signed by the Prime Contractor.
- B. A request for each substitution must be exactly in this form, including all items. (One (1) item of substitution per form).
- C. Attach complete information on changes to Drawings and Specifications that proposed substitution will require for its proper installation.
- D. Submit with request, all necessary samples and substantiating data to prove quality and performance is equal to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance

CONTRACT AWARD DATE: \_\_\_\_\_ DATE OF REQUEST: \_\_\_\_\_

CONTRACTOR: \_\_\_\_\_

PROJECT: \_\_\_\_\_

—

We hereby submit for your consideration the following substitution in lieu of the specified item for the above project:

SPEC. SECTION NO.: \_\_\_\_\_ PARAGRAPH: \_\_\_\_\_ SPECIFIED ITEM: \_\_\_\_\_

PROPOSED  
SUBSTITUTION: \_\_\_\_\_

REASON  
FOR  
REQUEST: \_\_\_\_\_

—

ITEMIZED COMPARISON OF SPECIFIED ITEM WITH THE PROPOSED SUBSTITUTION:  
PERFORMANCE: \_\_\_\_\_

—

APPEARANCE: \_\_\_\_\_

—

REFERENCED  
STANDARDS: \_\_\_\_\_

DEDUCT CHANGE ORDER OFFERED FOR PROPOSED SUBSTITUTION: \_\_\_\_\_

MANUFACTURER'S WARRANTIES OF THE PROPOSED AND SPECIFIED ITEMS:

LENGTH OF WARRANTY: AS SPECIFIED [  ]. PROPOSED [  ]

MATERIALS COVERED: AS SPECIFIED [  ]. PROPOSED [  ]

LABOR COVERED: AS SPECIFIED [  ]. PROPOSED [  ]

OTHER TERMS: AS SPECIFIED: \_\_\_\_\_

PROPOSED SUBSTITUTION: \_\_\_\_\_

DESIGNATION OF MAINTENANCE SERVICES AND SOURCES: \_\_\_\_\_

DOES SUBSTITUTION AFFECT DIMENSIONS OR CLEARANCES SHOWN ON THE  
DRAWINGS? YES [  ] NO [  ].

IF YES, CLEARLY INDICATE  
CHANGES: \_\_\_\_\_

—

WILL THE UNDERSIGNED PAY FOR CHANGES TO THE BUILDING DESIGN, INCLUDING  
ENGINEERING AND DETAILING COSTS CAUSED BY THE REQUESTED SUBSTITUTION?  
YES [  ] NO [  ].

IF NO, FULLY EXPLAIN: \_\_\_\_\_

—

WHAT EFFECT DOES SUBSTITUTION HAVE ON OTHER CONTRACTS OR TRADES?\_\_

---

WHAT EFFECT DOES SUBSTITUTION HAVE ON CONSTRUCTION SCHEDULE? \_\_\_\_\_

---

CONTRACTORS CERTIFICATION OF EQUAL PERFORMANCE

The undersigned certifies that:

He/she has investigated the proposed substitution and has determined that it is equal to or better than the product specified.

He/she will guarantee the substitution in the same manner as the product specified.

He/she will coordinate and make other changes as required in the Work as a result of the substitution.

He/she waives all claims for additional costs as a result of the substitution, with the exception of those identified above under "cost data".

He/she will reimburse the City for all costs for design change resulting from the substitution.

Submitted by:

Signature \_\_\_\_\_

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Firm: \_\_\_\_\_ Date: \_\_\_\_\_

Street: \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

Telephone: \_\_\_\_\_

Signature shall be by person having authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in rejection without further review by Design Professional.

Design Professional's Action

Accepted [  ]

Accepted as noted [  ]

Not accepted [  ]

Received too late [  ]

Signature: \_\_\_\_\_

-END-]

SECTION 01 2600  
CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 CHANGE ORDER PROCEDURE

- A. If a change in the design of any portion of the work or the requirements of the Project Manual is deemed necessary by the City/PRA, they may order an alteration to, or a change in, the work covered by the Contract Documents, and the contractor shall comply with such orders. If such changes increase the cost of the work to the Contractor, the City/PRA will allow additional compensation. If such changes diminish the cost of the work to the Contractor the City/PRA may deduct the amount of the diminution. No consequential loss or profit due to reduction in the scope of work will be allowed the Contractor, but the Contractor may be entitled to an extension of time in these instances. No changes shall be made except upon a standard Change Order Form, signed and executed by the Contractor and the City/PRA authorizing the change and fixing the method of compensation or deduction. This Section specifies administrative and procedural requirements for handling and processing Change Orders.
- B. The execution of a change order (increase or decrease) will require a proposal from the Contractor on company letterhead. Such proposal will include a complete description of the change and schedule impact and a complete cost breakdown including such items as Labor, Materials, Equipment, Crew Composition, Sub-Contractor costs, and associated Insurance and Bonding costs (if applicable). The contractor is entitled to percentage mark-ups on some of these items as stated in the Standard Contract Requirements. The proposal is to be submitted to the City/PRA. Upon review and approval by the City/PRA Project Team, a signed standard Change Order Form will be forwarded to the Contractor for final execution.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements and other Division 1 sections of the Standard Contract Requirements (007200).

1.3 CONTRACTOR'S RESPONSIBILITY TO INFORM

- A. Communication, either verbal or written, between the City/PRA or Design Professional and the Contractor, Subcontractors, or other parties involved, during the normal course of administration of the Contract, does not in any way constitute acceptance of a Change Order or direction to modify the Contract unless said communication is in the form of a written Change Order or Construction Change Directive as specified herein.
- B. Communication from the City/PRA or Design Professional including, but not limited to the following, does not constitute approval of a Change Order:
  - 1. Submittal review including submittals returned with notations and corrections;
  - 2. Site observation, conversation and reports;
  - 3. Participation in pre-construction, pre-installation, progress or other meetings;
  - 4. Clarification sketches or drawings.
- C. It is the responsibility of the Contractor to inform the City/PRA that any communication has, in the Contractor's opinion, caused reason to modify the Contract. The Contractor shall not undertake work which, in his opinion, requires a Change Order without completing procedures outlined herein.
- D. Work done without completing Change Order procedures is entirely at the Contractor's own risk, even if the Contractor believes that communications from

the City/PRA or Design Professional contain instructions to do work outside of the Contract scope.

- E. The City/PRA and Design Professional will not willfully instruct work to be done that differs from the contract except through the Change Order procedures contained herein.

#### 1.4 MINOR CHANGES IN THE WORK

- A. Supplemental instructions, not involving an adjustment to the Contract Sum or Contract Time, may be issued in writing by the PRA.

#### 1.5 CHANGE ORDER PROPOSALS

- A. City/PRA-Initiated Change Order Proposal - Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the City/PRA, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.

1. Change Order Proposal requests issued by the City/PRA are for information only. Do not consider them as instruction either to stop work in progress, accelerate the work or to execute the proposed change.
2. Unless otherwise indicated in the Change Order Proposal request, within 20 days of receipt of the Change Order Proposal request, submit to the City/PRA for review, an estimate of cost necessary to execute the proposed change.
  - a. Include a list of quantities of products to be purchased and unit costs, along with the total amount of purchases to be made. Separate labor and material charges. Where requested, furnish survey data to substantiate quantities.
  - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
  - c. Include a statement indicating the effect the proposed change in the Work will have on the Contract Time or any special efforts of the Contractor that will be employed to reduce the delay.
  - d. Indicate that the Change Order Proposal is in response to a City/PRA request and submit it to the City/PRA as stated in 1.1 (B) of this section.

- B. Contractor-Initiated Change Order Proposal – When Contractor claims latent or other unforeseen conditions require modifications to the Contract, the Contractor may propose changes by submitting a Change Order Proposal.

1. Include a statement outlining the reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and Contract Time.
2. Include a list of quantities of products to be purchased and unit costs along with the total amount of purchases to be made. Where requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Comply with requirements in Section 012500 “Substitution Procedures” if the proposed change in the Work requires the substitution of one product or system for a product or system specified.
5. Submit the proposal to the City/PRA as stated in 1.1 (B) of this section.

#### 1.6 ALLOWABLE MARKUPS

- A. For change orders, overhead and profit shall be the aggregate total amount allowed to the Contractor and shall include the costs of the Project Manager,

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CONTRACT MODIFICATION PROCEDURES



office personnel, small tools, among other things. The markup for overhead and profit shall be calculated as follows:

- i. Cost between \$0.00 and \$25,000.00 - **12%**
- ii. Cost between \$25,001.00 and \$50,000.00 - **10%**
- iii. Cost over \$50,000.00 - **8%**
- iv. Contractor markup for Subcontractor, and lower tier contractors shall not exceed **8%**

B. Under no circumstances shall the total combined markup for overhead and profit by the Contractor exceed the percentages for markup for overhead and profit indicated in Subparagraphs (1), (2), (3) and (4) above. The Rebuild Office shall make the final determination as to net cost of labor and materials. All Change Orders relating to price and/or time are subject to prior acceptance or approval by the Rebuild Office, or express ratification of Change Order work already for the Rebuild Office.

#### 1.7 ALLOWANCES

A. Refer to Section 012100, Allowances.

#### 1.8 CONSTRUCTION CHANGE DIRECTIVE (Force Account)

A. When the City/PRA and Contractor are not in total agreement on the terms of a Change Order Proposal, the City/PRA may issue a Construction Change Directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

B. The Construction Change Directive will contain a complete description of the change in the Work.

C. Documentation - Maintain detailed records on a time and material basis of work required by the Construction Change Directive. After completion of the change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

1. Contractor's documentation will not, by itself, establish the final cost.
2. The City/PRA reserves the right to determine the value of the change in Work per the requirements of this Section.

#### 1.9 DETERMINATION OF COST

A. City/PRA reserves the right to use established estimating methods (including but not limited to industry standards and unit prices listed in this manual) to determine a fair and reasonable cost for changes in the Work.

PART 2 PRODUCTS Not used.

#### PART 3 EXECUTION

3.1 Sample Change Order Form, contact Project Coordinator for actual document.

-END-

SECTION 01 2900  
PAYMENT PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies administrative and procedural requirements governing each Prime Contractor's submission of invoices for Payment. These may also be referred to as "Current Estimates" in the Standard Contract Requirements (007200).
- B. Coordinate the Contractor's Construction Schedule, List of Subcontracts, and Submittal Schedule with the Standard Cost Breakdown.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements and other Division 1 of the Standard Contract Requirements (007200).

1.3 GENERAL REQUIREMENTS

- A. Each invoice for payment shall be consistent with previous applications and payments.
- B. The initial submission of the Standard Cost Breakdown at time of Substantial Completion, and the final Standard Cost Breakdown involve additional requirements.
- C. Withholding Payment - Any payment may be withheld in accordance with the Contract Documents
  - 1. Any payment may be withheld if the procedural requirements including submittal of current administrative items listed including Certificates of Insurance are incomplete or outdated.
  - 2. Portions of payment requested for Work installed without approved submittals may be withheld.
- D. Standard Cost Breakdown Preparation - Complete every entry on the Standard Cost Breakdown:
  - 1. Contractor (name and address)
  - 2. Contract number (from Notice to Proceed);
  - 3. Requisition No. (sequential number);
  - 4. Date Prepared;
  - 5. Project (title of project);
  - 6. STANDARD COST BREAKDOWN
    - a. No. (sequentially numbering);
    - b. Item (phases of scope of work);
    - c. Unit (each, sq. ft., etc.);
    - d. Material;
    - e. Labor;
    - f. Unit Cost;

g. Total (total of Material and Labor).

7. PAYMENT APPLICATION

- a. Previous Billing (as billed previous application);
- b. Percent Complete (completed to date);
- c. Total Completed (Total column under COST BREAKDOWN multiplied by Percent Complete column under PAYMENT APPLICATION.)

Incomplete Standard Cost Breakdowns will be returned without action.

- E. Entries shall match data on the Contractor's Construction Schedule. Use updated schedules if revisions have been made.
- F. Include amounts of Change Orders issued prior to the last day of the construction period covered by the Standard Cost Breakdown.
- G. Submit original plus 2 copies of each Standard Cost Breakdown to the Robert LaBrum, Director, Design & Construction, PRA, 1234 Market Street, 16<sup>th</sup> Floor, Philadelphia, PA 19107

1.4 INITIAL STANDARD COST BREAKDOWN

- A. Actions and submittals that shall precede or coincide with submittal of the first Standard Cost Breakdown include the following:
  - 1. List of subcontractors.
  - 2. List of principal suppliers and fabricators.
  - 3. Schedule of Values.
  - 4. Contractor's Construction Schedule (preliminary if not final).
  - 5. Schedule of unit prices.
  - 6. Submittal Schedule (preliminary if not final).
  - 7. List of Contractor's staff assignments.
  - 8. List of Contractor's principal consultants.
  - 9. Copies of building permits.
  - 10. Copies of authorizations and licenses from governing authorities for performance of the Work.
  - 11. Report of pre-construction meeting.
  - 12. Certificates of insurance.
  - 13. Performance and payment bonds.
  - 14. Complete Submittals for each product or system included in the Application.
  - 15. Initial settlement survey and damage report.
  - 16. Reference Point Survey.
  - 17. Current Daily and Monthly Reports.
  - 18. Initial Construction Photographs and/or videos.

1.5 STANDARD COST BREAKDOWN AT SUBSTANTIAL COMPLETION

- A. This Standard Cost Breakdown shall reflect any Certificates of Partial Substantial Completion issued previously for City occupancy of designated portions of the Work.

- B. Actions and submittals which shall proceed or coincide with this Standard Cost Breakdown include:
1. Occupancy permits and similar approvals.
  2. Warranties (guarantees) and maintenance agreements.
  3. Test/adjust/balance records.
  4. Maintenance instructions.
  5. Utility meter readings.
  6. Start-up performance reports.
  7. Certified improvement survey.
  8. Change-over information related to City's occupancy, use, operation and maintenance.
  9. Final cleaning.
  10. Final progress photographs.
  11. List of incomplete Work (punch list), recognized as exceptions to Certificate of Substantial Completion.
  12. Record Documents.

1.6 FINAL STANDARD COST BREAKDOWN

- A. Actions and submittals which shall precede or coincide with submittal of the final Standard Cost Breakdown include the following:
1. Project Closeout Form fully executed (signed).
  2. Completion of items specified for completion after Substantial Completion (punch list).
  3. Assurance that unsettled claims will be settled.
  4. Assurance that Work not complete and accepted will be completed without undue delay.
  5. Transmittal of required Project construction records to City/PRA.
  6. Proof that taxes, fees and similar obligations have been paid.
  7. Removal of temporary facilities and services.
  8. Removal of surplus materials, rubbish and similar elements.
  9. Change of door locks to City's access.

- END -



## SECTION 01 2973

### SCHEDULE OF VALUES (CURRENT ESTIMATE)

#### PART 1 GENERAL

##### 1.1 DESCRIPTION OF WORK

- A. This Section describes administrative requirements for each Prime Contractor's Schedule of Values, referred to as "Current Estimate" in the Standard Contract requirements.

##### 1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

##### 1.3 COORDINATION

- A. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:
  1. Contractor's Construction Schedule.
  2. Standard Cost Breakdown
  3. List of subcontractors.
  4. Schedule of allowances.
  5. Schedule of alternates.
  6. Schedule of submittals.
- B. Submit the Schedule of Values to the City no later than ten (10) days after receipt of the Notice to Proceed. Submit six (6) copies.

##### 1.4 FORMAT AND CONTENT

- A. Arrange the Schedule of Values in a tabular form with separate columns to indicate the following for each item listed:
  1. Generic name.
  2. Related Specification Section.
  3. Name of subcontractor.
  4. Name of manufacturer or fabricator.
  5. Name of supplier.
  6. Change Orders (numbers) that have affected value.
  7. Dollar value.
  8. Percentage of Contract Sum to the nearest one-hundredth percent, adjusted to total 100 percent.
  9. Margins of Cost - Show line items for indirect costs, and margins on actual costs, only to the extent that such items will be listed individually in Standard Cost Breakdown. Each item in the Schedule of Values and Standard Cost Breakdown shall be complete including its total cost and proportionate share of general overhead and profit margin unless otherwise indicated.

10. At the Contractor's option, temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown as separate line items in the Schedule of Values or distributed as general overhead expense.
11. Itemize separate line item cost for the following items under Division 1:
  - a. Field Engineering.
  - b. Construction Photographs.
  - c. Mock-up.
12. Itemize separate line item cost for each of the construction cost items under all applicable specification sections.
13. Itemize separate line item cost for each service contract.
14. Breakdown costs into:
  - a. Delivered cost of material, with taxes paid, with overhead and profit.
  - b. Installation cost, with overhead and profit.
  - c. If requested, break down high value line items to list major materials or operations.
  - d. Round off figures to nearest ten dollars.
  - e. Make sum total costs of all items listed in Schedule equal to Contract Limit.

1.5 UPDATING

- A. After review by the City, revise and resubmit schedules as required.
- B. Update and resubmit the Schedule of Values when change orders or construction change directions result in a change in the Contract Limit.

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION                    Not Used

- END -

SECTION 01 3113  
PROJECT COORDINATION

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section includes the General Contractor's responsibilities to coordinate the work and related administrative procedures.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 SUBMITTALS

- A. Submit the following prior to or coincidental with the initial application for payment.
1. List of contractor's staff assigned to the project and responsibilities including personnel on and off-site. Include mailing address, delivery address, phone, fax, mobile phone, etc. For at least three (3) staff, list phones where personnel can be reached during non-work hours for emergencies.
  2. List of contractor's consultants and sub-contractors with similar requirements as above.
  3. List of principal suppliers and fabricators with similar requirements as above. No emergency phone number required.

1.4 OBSERVATION OF WORK BY OTHERS

- A. Observation of the Work by the City/PRA, Design Professional, Inspection and Testing Agencies or any other party shall not be interpreted as relieving the Contractor from responsibility for coordination of all Work, superintendence of the Work, and scheduling and direction of the Work or any other requirement of the Contract.

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION                      Not Used

- END -



SECTION 01 3119  
PROJECT MEETINGS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies each Prime Contractor's administrative and procedural requirements for project meetings. Requirements contained herein in no way limit each Prime Contractor's responsibility to effectively communicate with parties involved in order to meet the requirements of the Contract.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Project Coordination: Division 1.
- C. Construction Scheduling: Division 1.

1.3 ADMINISTRATION

- A. The Philadelphia Redevelopment Authority ("PRA") will schedule and administer the pre-construction meetings, periodic project meetings, pre-installation, coordination and other specially called meetings throughout the progress of the work. They will also:
  - 1. Prepare agenda for meetings.
  - 2. Distribute written notice of each meeting four (4) days in advance of meeting date.
  - 3. Make physical arrangements for meetings.
  - 4. Preside at meetings.
- B. During the course of the pre-construction meetings, periodic project meetings, pre-installation, coordination and other specially called meetings throughout the progress of the work, the Design Professional will:
  - 1. Record the minutes, including all significant proceedings and decisions.

- C. Representatives of Contractors, subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.

1.4 PRE-CONSTRUCTION MEETING

A. Attendance

1. Project Coordinator.
2. Design Professional's Representative.
3. Prime Contractor's Representatives.
4. Major subcontractors.

B. Suggested Agenda

1. Discussion of coordination of Prime Contracts.
2. Discussion on major subcontracts and suppliers and projected construction schedules.
3. Critical work sequencing.
4. Major equipment deliveries and priorities.
5. Project Coordination and designation of responsible personnel.
6. Procedures and processing of field decisions, proposal requests, submittals, change orders and applications for payment.
7. Procedures for maintaining Record Documents.
8. Use of premises, office, work and storage areas, and City's requirements.
9. Construction facilities.
10. Temporary utilities.
11. Housekeeping procedures.
12. Dispute resolution.

1.5 PROGRESS, PRE-INSTALLATION AND COORDINATION MEETINGS

A. Schedule regular and special meetings, as required by progress of the Work.

B. Location of the Meetings - The Project field office of the Contractor [or as otherwise directed].

C. Attendance

1. Project Coordinator.
2. Design Professional's Representative.
3. Contractor's Representatives.
4. Subcontractors as appropriate to the agenda.
5. Suppliers as appropriate to the agenda.
6. Others as appropriate.

D. Suggested Agenda

1. Review and approval of minutes of previous meeting.
2. Review of work progress since previous meeting.

3. Field observations, problems, and conflicts.
4. Problems which impede Construction Schedule.
5. Coordination issues between Prime Contractors.
6. Review of off-site fabrication, delivery schedules.
7. Corrective measures and procedures to regain projected schedule.
8. Revisions to Construction Schedule.
9. Plan progress, schedule, during succeeding work period.
10. Coordination of schedules.
11. Review submittal schedules; expedite as required.
12. Maintenance of quality standards.
13. Review proposed changes for:
  - a. Effect on Construction Schedule and on completion date.
  - b. Effect on other contracts of the Project.
14. Review record drawings.
15. Other business.

PART 2 PRODUCTS Not Used

PART 3 - EXECUTION Not Used

- END -

SECTION 01 3216  
CONSTRUCTION SCHEDULING

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies administrative and procedural requirements for schedules prepared by each Prime Contractor.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 CONSTRUCTION SCHEDULE

- A. Each Prime Contractor shall prepare a Contractor's Construction Schedule including all phases of work as follows:
1. Initial Construction Schedule - Within 10 (ten) calendar days after Notice to Proceed, submit an initial construction schedule. Break down at least by 16 Division Specification format for General Construction and into at least 12 operations for Electrical, Plumbing, or Mechanical Construction. This schedule must be in agreement with the time frame stated in the Bid Proposal. Coordinate schedule with the following:
    - a. Prepurchase products.
    - b. Allowances.
    - c. Application for Payments.
    - d. Mock-ups.
    - e. Schedule of Submittals.
    - f. Schedule of Values.
  2. Final Construction Schedule - Within 20 (twenty) calendar days after Notice to Proceed, submit a complete detailed construction schedule showing each activity having impact upon the timely completion of the Project. Activities shall be broken down generally similar to the individual specification sections but not less than 20 separate operations. The schedule shall include, but not be limited to the following:
    - a. Schedule each activity with a time limit per activity not to exceed ten (20) working days.
    - b. Time frames for testing of materials.
    - c. Time frames for shop fabrication and delivery of all parts of the work. Identify by specification section number and title. Coordinate with Schedule of Submittals. Allow time for reviews, resubmissions, and approval.
    - d. Decision dates for selection of finishes and colors.
    - e. Decision dates for selection of products specified by allowances.
    - f. Deadlines for submissions of substitutions.
    - g. Identification for work of mock-ups, separate phases or other logically grouped activities.
    - h. Separate network for each trade or operation.

1.4 FORMAT

- A. Initial Construction Schedule - Horizontal bar chart form divided vertically by weeks.
- B. Final Construction Schedule - Horizontal bar chart form showing each trade or operation.

#### 1.5 SCHEDULE OF SUBMITTALS

- A. Submit a preliminary Schedule of Submittals within 30 days after the Notice to Proceed. Submit the final schedule with the final Contractor's Construction Schedule.
- B. Coordinate submittal schedule with the list of subcontracts, schedule of values, submittal register and the Contractor's construction schedule.
- C. Coordinate scheduling of interrelated submissions to allow for review of required data and to avoid delays in reviewing submittals caused by lack of coordinated submission.
- D. Coordinate scheduling of submission to allow for approval of products prior to construction of mock-up.
- E. Contractor shall estimate number of resubmissions required for each submittal based on complexity. However, the submittal schedule in no way binds the City to approve a submittal to meet the submittal schedule or construction schedule. It is the contractor's sole responsibility to prepare acceptable submissions in a timely fashion in order to maintain schedule.
- F. Allow for City's and Design Professional's review of each submission and resubmission.
- G. Prepare the schedule in chronological order. Provide the following information:
  - 1. Related Section number.
  - 2. Submittal category.
  - 3. Name of subcontractor.
  - 4. Description of the part of the Work covered.
  - 5. Scheduled date for the first submittal.
  - 6. Scheduled date for resubmittal or resubmittals.
  - 7. Scheduled date the City's final release or approval.
- H. Distribution - Following response to initial submittal, print and distribute copies to the City, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
- I. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

#### 1.6 COORDINATION

- A. All Prime Contractors shall submit their schedules to the General Contractor.
- B. The General Contractor shall prepare an overall schedule including all trades and contracts.
- C. The City will resolve conflicts among schedules of various Prime Contractors.
- D. The General Contractor shall distribute copies of the approved final Construction Schedule to other Prime Contractors involved.

#### 1.7 UPDATING

- A. Updating of the final Construction Schedule and Schedule of Submittals shall be required on a monthly basis.

- B. Show all changes occurring since previous submission of updated schedules.
- C. Indicate progress of each activity, show completion dates.
- D. Include major changes in scope, activities modified since previous updating, revised projections due to changes and other identifiable changes.

1.8 DISTRIBUTION

- A. Distribute copies of revised schedules to:
  - 1. Project Coordinator.
  - 2. Design Professional.
  - 3. Other Prime Contractors.
  - 4. Subcontractors.
  - 5. Other Concerned Parties (surety, insurance, etc.).
  - 6. Instruct recipients to report any inability to comply, and provide detailed explanation, with suggested remedies.

PART 2 PRODUCTS            Not Used

PART 3 EXECUTION        Not Used

- END -

SECTION 01 3233  
CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes photographic services provided by the General Contractor required to record the progress of the work of all Prime Contractors.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 SUBMITTALS

- A. Digital images – color images of each view, containing accurate camera-generated date/time stamp embedded in image, and sufficient background image to orient view to overall site if possible. For close-up images, include an additional photograph showing the relationship of close-up area to overall site. Forward electronic copies to City and Design Professional and retain copy for Contractor's files. Each individual photograph's electronic file to be named using the following naming convention using the date image was taken:

YYYY-MM-DD[space]Projectname[space](specific or general description as needed)

For example: 2018-10-28 Torresdale wall footing

- B. Submit hard copy images within text, or attached to end of, monthly progress reports.

PART 2 PRODUCTS

2.1 DIGITAL IMAGES

- A. Color
- B. 2 images maximum per 8.5" x 11" sheet.
- C. Minimum image size shall be 3 inches by 5 inches.
- D. Identify each image listing:
  - 1. Name of project.
  - 2. Orientation of view.
  - 3. Date and time stamp automatically recorded by camera within image.
  - 3. Name and address of photographer.

PART 3 EXECUTION

3.1 DIGITAL IMAGES (ELECTRONIC FILES)

- A. Take 30 initial photographs and 30 photographs (minimum) once monthly from points designated by the Project Manager, for the length of the Contract. First photographs shall be taken prior to start of construction. Include additional images as needed to memorialize key stages in construction process.
- B. Take photographs of installed subsurface features— especially underground utility locations — prior to backfilling or covering over, clearly showing orientation to overall site.

- END -

## SECTION 01 3330 SUBMITTALS

### PART 1 GENERAL

#### 1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's administrative and procedural requirements for submission of shop drawings, product data, samples and other required information.

#### 1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Submittal Schedule specified in Construction Scheduling, Section 013216.

#### 1.3 WORK WITHOUT APPROVED SUBMITTALS

- A. City may withhold payment for the value of Work installed without first obtaining approved submittals, when submittal is required by individual specification sections. Refer to section 012900 "Payment Procedures".

#### 1.4 SHOP DRAWINGS

- A. Shop drawings are Contractor's or subcontractor's Drawings made specifically for this Project, for use in fabrication and installation.
- B. Shop drawings must show sufficient data including layout, fabrication and erection details to establish evidence of conformance with design concept and compliance with the Contract Documents. Shop drawings must show relationships with adjacent construction.
- C. Do not use reproductions of Contract Drawings as Shop Drawings unless specifically permitted in the Contract Documents.
- D. Identify details by reference to sheet and detail numbers shown on Contract Drawings and by reference to paragraphs and specification section.
- E. Orient Shop Drawings in same manner as drawings.
- F. Manufacturer's Standard Schematic Drawings
  1. Modify drawings to delete information that is not applicable to Project. Drawings showing information which is not applicable or unaltered standard drawings shall be returned without review.
  2. Add supplemental information applicable to Project.

#### 1.5 PRODUCT DATA

- A. Manufacturer's Catalog Sheets, Brochures, Diagrams, Schedules, Performance Charts, Illustrations and Other Standard Descriptive Data.
- B. Clearly mark each copy to identify materials, products or models applicable to this Project. Submittals not marked shall be returned without review.
- C. Show colors when required for evaluation, record or other purpose. Where product data is printed in color, submit all copies in original colors as published.
- D. Show dimensions and clearances required.
- E. Show performance, characteristics and capacities.



- F. Show wiring and piping diagrams, and controls.
  - G. Show by reference to paragraphs and specification section.
- 1.6 SAMPLES
- A. Samples: Actual samples of products proposed for use. Samples must be of sufficient size and quantity to clearly illustrate:
    - 1. Functional characteristics of product or material, with integrally related parts and attachment devices.
    - 2. Full range of color, texture and patterns.
- 1.7 FIELD SAMPLES AND MOCKUPS
- A. Erect at project site in location as directed.
  - B. Construct each sample or mock-up complete, including work of all trades required in the finished work.
  - C. Remove mockup at conclusion of work or when directed by City.
- 1.8 COORDINATION
- A. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
  - B. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
  - C. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
  - D. The City reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
  - E. When mock-ups are required, submittals for all products used in mock-up shall be coordinated with schedule for mock-up construction.
- 1.9 SUBMISSION REQUIREMENTS
- A. Comply with Schedule of Submittals.
  - B. Accompany each submission with a transmittal indicating project name, location, City's project number, referenced specification number, submission number, date, item submitted, Contractor's name, Sub-contractor, supplier or manufacturer.
    - 1. Transmittal shall include Contractors certification that information complies with Contract Documents.
    - 2. Indicate on transmittal or on submittal deviations from Contract Documents requirements.
  - C. Copies
    - 1. For sample selections, submit one (1) set. For sample approval, submit three (3) sets. The Design Professional will retain one (1) set.
  - D. Where product data is printed in color and requires color for evaluation, record, or other purpose, all copies submitted shall be in original colors as published.
  - E. In addition to information required on the transmittal, submittals shall include:
    - 1. Relation to adjacent structure or material
    - 2. Field dimensions, clearly identified as such.

3. Finishes.
  4. Shipping and operating weights
  5. Gauges, fastenings, reinforcements, welding details.
  6. Applicable standards, such as ASTM or Federal Specification numbers.
  7. A blank space, 3 inches by 10 inches for action stamp.
- F. Contractor's Review:
1. Contractor shall review each submittal and indicate approval with a stamp, dated, initialed and/or signed. Review shall include but not be limited to; verification of field measurements, coordination with all trades involved and compliance with Contract Documents. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the City's or Design Professional's action on submittals unless the Contractor has given specific notice of deviation at the time of submission and written approval of the specific deviation is given. The Contractor shall not be relieved from responsibility for errors or omissions in submittals by the City's or Design Professional's approval thereof.
  2. If Contractor does not review submittals and provide the signed approval stamp before sending them to the Design Professional, they will be returned unchecked.

#### 1.10 SUBMISSION ROUTING

- A. Forward submittal direct to Design Professional via Unifier and email copy of transmittal letter to Project Coordinator.
- B. Design Professional will forward Submittals marked as "Approved" or "Approved as Noted" to Project Coordinator.
- C. Design Professional will forward Submittals marked as "Revise and Resubmit" or "Rejected" back to Contractor and will fax copy of transmittal to Project Coordinator.
- D. Project Coordinator will forward Submittals back to Contractor and email copy of transmittal to Design Professional.

#### 1.11 DESIGN PROFESSIONAL'S DUTIES

- A. Review submittals within 10 working days of receipt.
- B. Review for conformance to design concept of Project and for compliance with information given in Contract Documents. Review of separate item does not constitute review of an assembly in which item functions.
- C. Affix stamp and initials or signature certifying to review of submittal.
- D. Design Professional's action on submittals will result in the making of one of the following notations with related meanings:
  1. APPROVED: The work involved may proceed, and no further submission is required.
  2. APPROVED AS NOTED: The work involved may proceed incorporating comments. Annotations do not authorize changes to Contract Sum.
  3. REVISE AND RESUBMIT: The work involved may not proceed. Submittal must be corrected and resubmitted.
  4. REJECTED: The submittal is not in accordance with the Contract Documents, and a completely new submittal is required.

- E. In the event any comment made to the Submittal results in a claim for a change in the Contract, the Project Coordinator shall be notified immediately, and fabrication may not be undertaken until contract modification procedures are completed.

1.12. CITY'S RESPONSIBILITY

- A. Review submittals within 5 working days of receipt.
- B. Review for compliance Contract Documents. Review of separate item does not constitute review of an assembly in which item functions.
- C. Affix stamp and initials or signature certifying to review of submittal.
- D. City's action on submittals will result in the making of one of the following notations with related meanings:
  - 1. NO EXCEPTION TAKEN: The work involved may proceed, and no further submission is required.
  - 2. MAKE CORRECTIONS NOTED, RESUBMISSION NOT REQUIRED: The work involved may proceed by incorporating comments. Annotations do not authorize changes to Contract Sum.
  - 3. REVISE AND RESUBMIT: The work involved may not proceed. Submittal must be corrected and resubmitted.
  - 4. SUBMIT SPECIFIED ITEM: Substitution of specified item not permitted.
  - 5. REJECTED: The work involved may not proceed. Submittal must be resubmitted.

1.13 RESUBMISSION REQUIREMENTS

- A. Identification of Changes - Clearly identify changes made from the initial submittal other than those requested by the Design Professional. The Design Professional will review only those changes requested and those identified by the Contractor.

1.14 DISTRIBUTION OF APPROVED SUBMITTALS

- A. Contractor shall reproduce and distribute copies of submittals having the Design Same Professional's and City's stamp ("Approved" or "Approved as Noted") as required to coordinate and complete the Work and to records documents file.

1.15 SUBSTITUTIONS

- A. Substitutions submitted as a shop drawing, product data or sample will be returned without action.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

- END -

## SECTION 01 3513.18

### SPECIAL REQUIREMENTS FOR WORK WITHIN THE PHILADELPHIA PARKS & RECREATION SYSTEM

#### PART 1 GENERAL

##### 1.1 DESCRIPTION OF WORK

- A. This section describes special administrative and procedural requirements for all contractors, subcontractors and their employees performing work within the Philadelphia Parks & Recreation System under the jurisdiction of Philadelphia Parks & Recreation.

##### 1.2 DEFINITIONS

- A. "Park Authorities" or "proper authorization" shall mean the Park Engineer or Project Manager unless specified otherwise.
- B. "Personnel" shall mean all employees or related staff or associates of the contractors, subcontractors, suppliers, delivery services, consultants, testing or inspection agencies, or other group performing work or services required for completion of this contract.

##### 1.3 ADMINISTRATION REQUIREMENTS

- A. All Contractors must complete an Application for Permit (a form of which is attached to the end of this section). This Permit Application must be submitted to the Park Engineer and approved before the start of any work on Park property.
- B. All work is to be coordinated with the Park Engineer or designated representative to minimize disruption to the Parks & Recreation's daily operations, programs, and special events.

##### 1.4 ACCESS, STAGING, STORAGE AND PROPOSED WORK

- A. All Contractors' must provide a Logistic Plan including access, staging, storage and the proposed work to be reviewed and approved by the Park Engineer.
- B. No parking of any vehicles or equipment on grass areas.
- C. Trees within proximity of work, plant materials, and historic features are to be protected from injury.
- D. Advise the Park Engineer of any hazardous materials proposed and provide all Material Safety Data Sheets for such materials.
- E. Truck tires to be free from mud when leaving work site. All truck and debris containers must be covered tightly to prevent dust and spillage.

##### 1.5 PERSONNEL ACTIVITY

- A. The following items are prohibited from being brought into the Park areas and construction sites, any violation of these regulations may result in default of contract and may additionally be subject to prosecution:
  - 1. Alcoholic beverages and drugs.
  - 2. Explosives and firearms.
  - 3. Inflammable material except as required for performance of work (with prior Parks & Recreation approval).

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION                    Not Used

END



## SECTION 01 3591

### HISTORIC TREATMENT PROCEDURES

#### 1.1 SUMMARY

- A. General protection and treatment procedures for designated historic spaces, areas, rooms, and surfaces. It is the intention of this project to preserve designated areas within the building for future historic preservation.

#### 1.2 QUALITY ASSURANCE

- A. Preservation protection program.
- B. Preservation Area Protection Plan.
- C. Historic treatment preconstruction conference.
- D. Before commencing work in the building, provide photographs and video of existing conditions of areas indicating on the Drawings as "Existing to Remain: Protect for Future Preservation." Especially document existing conditions which could be misconstrued as damage resulting from selective demolition work. File photographs and video with the Construction Manager prior to starting work.

#### 1.3 PROJECT CONDITIONS

- A. City will not occupy portions of building immediately adjacent to removal and dismantling area.

#### 1.4 EXECUTION

- A. Areas for Preservation:
  - 1. Areas indicating on the Drawings as "Existing to Remain: Protect for Future Preservation" are excluded from the scope of selective demolition. These areas are to be protected by the Contractors. No invasive work or removal of building and finish materials is allowed in these areas. This includes removal of building systems, ductwork, plumbing, conduit or abatement of installed hazardous building materials.
  - 2. All selective demolition for all Contractors is to be terminated outside the envelope shown on the drawings for "Existing to Remain: Protect for Future Preservation."
    - a. All building systems i.e. conduit, ductwork, sprinkler and plumbing piping shall be terminated 12" outside the envelope of the preservation area.
  - 3. Contractors shall enforce restricted access to areas indicated as "Existing to Remain: Protect for Future Preservation." Entry to these areas shall only be by essential personnel as verified by the Construction Manager.
  - 4. Access through these spaces shall be limited to access required within the spaces. Route all general circulation, egress and hauling routes around these areas.
  - 5. Removal of existing debris and trash, including those areas requiring hazardous materials abatement, within the boundary of the areas indicating on the Drawings as "Existing to Remain: Protect for Future Preservation" shall be conducted under the supervision of the Construction Manager.

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

01 3591-1

HISTORIC TREATMENT PROCEDURES

B. Protection:

1. Maintain supervisory personnel on-site and on duty during work in and adjacent to areas designated for preservation.
2. Provide barricades, barriers, and temporary directional signage to exclude non-essential construction personnel.
3. Provide shoring, bracing, and supports as required to maintain the perimeter of areas to be protected to prevent movement, settlement or collapse of areas to be demolished as adjacent facilities to remain.
4. Provide floor, wall, door, door frame and other surface protection along circulation, egress and haul routes.
5. Maintain protection for all exterior building and site feature surfaces and materials including, but not limited to masonry walls, windows, doors, stairs, site walls, fences, light fixtures, railings, roofing and other artifacts.
6. Prepare a Preservation Area Protection Plan for review by the Construction Manager. No construction shall commence until the Preservation Area Protection Plan is accepted by the Construction Manager. The Preservation Area Protection Plan shall show all barricades, barriers, directional signage, surface protection, circulation, egress and haul routes, and designation of access restriction.

1.5 HISTORIC REMOVAL AND DISMANTLING SCHEDULE

- A. No existing building materials or finishes shall be removed from the areas indicating on the Drawings as "Existing to Remain: Protect for Future Preservation." Any loose items in these areas shall be salvaged on site as per the direction and review of the Design Professional and Construction Manager.
- B. Historic artifacts, including their contents, commemorative plaques and tablets, antiques and other articles of historic significance remain property of the City. Notify the Construction Manager if such items are encountered and obtain acceptance regarding method of removal and salvage from the Design Professional.

1.6 HISTORIC PRESERVATION SCHEDULE

- A. Spaces, areas, rooms, and surfaces requiring special care and treatment to ensure successful preservation are indicated on Drawings as "Existing to Remain: Protect for Future Preservation."
- B. Please note that areas designated as "Existing to Remain: Protect for Future Preservation" may isolate the areas for selective demolition into two separate areas. Provide access and haul routes from these selective demolition areas that do not pass through the area for future preservation. This may require routes through intervening floors or two separate vertical routes.

END OF SECTION 090391

SECTION 01 4100  
CODES, REGULATIONS AND STANDARDS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's responsibilities regarding codes, regulations and standards included in the Contract Documents by reference.

1.2 RELATED REQUIREMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. All technical sections.

1.3 APPLICABLE CODES AND REGULATIONS

- A. The following codes and regulations are applicable to the project. The list does not represent all codes, regulations and standards:

- 1. The Philadelphia Building Construction and Occupancy Code
  - a. The Philadelphia Administrative Code
  - b. The Philadelphia Building Code
  - c. The Philadelphia Electrical Code
  - d. The Philadelphia Fire Prevention Code
  - e. The Philadelphia Mechanical Code
  - f. The Philadelphia Plumbing Code
  - g. The Philadelphia Property Management Code

- B. It is not the intent of the Contract Documents to conflict with any Code, or Regulation. Report any conflicts to Design Professional for clarification.

1.4 REFERENCED STANDARDS

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes or intended use.
- B. The referenced standards shall have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- C. Should specified reference standards conflict with Contract Documents, request clarification from Design Professional before proceeding but generally the more stringent requirement shall apply.
- D. In the absence of specific instructions in the specifications, materials, products, equipment, and their installation shall conform to the applicable codes, regulations and standards specified herein.
- E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any referenced document.



- F. Dates of codes, regulations and standards specified shall be the latest date prior to the date of issue of this Project Manual, except where, prior to the date of issue of this Project Manual, modified or otherwise directed by the applicable codes and their supplements and amendments adopted by the code authorities having jurisdiction.
- G. Each entity engaged in construction of the Project shall be familiar with industry standards applicable to its construction activity. If unfamiliar, obtain copies and review with all workers. Obtain copies of standards when required by individual specification sections. Maintain copy at job site until Substantial Completion.

1.5 ASSOCIATIONS, INSTITUTIONS AND SOCIETIES

- A. Associations, Institutions, and Societies and their abbreviations if any, appearing in the Project Manual or elsewhere in the Contract Documents, shall be as generally recognized in the industry. Refer to the "Encyclopedia of Associations" published by Gale Research Company for abbreviations, addresses and phone numbers.

PART 2 PRODUCTS                      Not Used

PART 3 PRODUCTS                      Not Used

- END -

SECTION 01 4516.13  
CONTRACTOR'S QUALITY CONTROL

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. This section describes each Prime Contractor's requirements for quality assurance including:
  - 1. Control of installation
  - 2. Tolerances
  - 3. Mockups
  - 4. Inspection and Testing services
  - 5. Manufacturer's field services

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Each technical section required for materials and products in mockup
- C. Each technical section requiring independent inspection and testing.

1.3 QUALITY ASSURANCE – CONTROL OF INSTALLATION

- A. Each Prime Contractor is responsible to deliver Work of quality specified regardless Contractor's sub-contracting or purchasing arrangements.
- B. Monitor quality control over suppliers, manufacturer's products, services, site conditions and workmanship to produce Work of specified quality.
- C. Comply with manufacturers written instructions, including preparation and each step in sequence.
  - 1. Should manufacturer instructions differ from Contract Documents, request clarification but assume the more stringent will apply.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.

1.4 TOLERANCES

- A. Monitor tolerance control of installed products to produce acceptable Work. Do not allow tolerances to accumulate.
- B. Comply with manufacturers written tolerances.
  - 1. Should manufacturer tolerances differ from Contract Documents, request clarification but assume the more stringent will apply.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.5 INSPECTION AND TESTING SERVICES

- A. Each Prime Contractor shall retain independent inspection and testing services when required by individual specification sections or by building code authority.

- B. The independent agency shall perform inspection and testing services on and off site as required by individual specification sections and as required to comply with requirements of the building code authority.
- C. Independent agency shall submit reports to Prime Contractor and direct to City indicating compliance or non-compliance. Notify City the same day of non-compliance.
- D. Cooperate with independent agency; furnish samples, mix designs, equipment, tools, storage, safe access, and assistance by incidental labor.
- E. Inspection and testing does not relieve Contractor to perform Work to contract requirements.
- F. Retesting required because of non-conformance to specified requirements shall be performed by the original agency at no additional cost to City.

1.6 MANUFACTURERS FIELD SERVICES

- A. When specified in individual specification sections, require manufacturer to provide qualified technical staff personnel to observe site conditions, quality of workmanship, start-up or training of City personnel as specified.
- B. Technical staff shall not be the local sales staff or independent manufacturers sales representatives.
- C. Manufacturers technical representative shall submit written reports of findings to Contractor and direct to City. Notify City the same day of non-compliance

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

END

SECTION 01 5000  
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's construction facilities and services required for performance of the Work but not a permanent part of the finished construction. Included are temporary utilities, temporary construction and support facilities and security and protection services.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Environmental Controls: Division 1.

1.3 SUBMITTALS

- A. Submit reports of tests, inspection, meter readings and similar procedures performed on temporary utilities.

1.4 INSPECTION

- A. Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certificates and permits.

PART 2 PRODUCTS

2.1 TEMPORARY MATERIALS

- A. Materials may be new or used, but must be adequate in capacity for the required usage and must not violate requirements of applicable codes and standards. Generally, temporary materials shall comply with related specification sections for materials to be incorporated into final work.

PART 3 EXECUTION

3.1 TEMPORARY UTILITIES

- A. Provide temporary utilities including water, drainage, electrical power, communications, lighting, and steam where applicable.
- B. Contractor shall pay all costs associated with temporary utilities.

3.2 TEMPORARY ELECTRICITY

- A. Provide electrical service adequate for work of all trades, and terminate in fused safety switch and circuit breaker distribution panels.
- B. For welding at site or electrical requirements beyond the capacity of temporary system, supply generator, fuel, maintenance, and other incidentals required.

3.3 TEMPORARY LIGHTING

- A. Provide temporary lighting required for construction operations

- B. Provide temporary lighting for exterior staging and storage areas for security purposes.
  - C. Provide temporary lighting in interior work areas after dark for security purposes.
  - D. Provide lighting at each landing of each stair or ladder run.
  - E. Permanent building lighting may [not] be utilized during construction.
- 3.4 HEATING AND VENTILATING
- A. Provide temporary heat as required for construction operations. Temporary sources of heat shall be direct vented and thermostatically controlled. Open flame devices or solid fuels are not allowed.
  - B. Provide forced ventilation by portions of the permanent system or by portable units, to cure materials, to disperse humidity, and to prevent accumulations of dust, fumes, vapors, or gases. Provide ductwork with temporary filters to prevent the broadcasting of dust and debris.
  - C. In occupied facilities, while performing operations that generate fumes or dust, provide both fresh air intake and fan powered ventilation to control spread of fumes or dust to occupied areas of the building.
- 3.5 TEMPORARY TELEPHONE
- A. City telephones on-site may not be used by Contractors.
- 3.6 TEMPORARY WATER SUPPLY
- A. Provide temporary water service of adequate size as required for fire protection and construction operations.
  - B. Provide drinking water, paper cups, and waste receptacles for personnel.
- 3.7 SANITARY FACILITIES
- A. Provide sanitary facilities according to law at locations approved by the City. Provide privacy enclosures, toilet paper, waste receptacles, and periodic janitorial services.
  - B. Enforce use of sanitary facilities. Evidence to the contrary shall require removal, disinfecting, and reconstruction of defaced work or landscape.
  - C. The use of the Owner's toilet facilities by construction personnel will not be permitted.
- 3.8 FIRE PROTECTION
- A. Provide temporary fire protection and portable fire extinguishers according to law.
- 3.9 CONSTRUCTION AIDS
- A. Provide construction aids required for execution of the work, including scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes, and other facilities and equipment.
  - B. Provide and operate drainage and pumping equipment; maintain excavations and site free of standing water. Coordinate with Division 2.
- 3.10 STAIRS AND ELEVATORS
- A. Designated existing stairs may be used by Construction personnel.
- 3.11 BARRIERS
- A. Provide barriers to prevent unauthorized entry to construction areas to allow for City's use of site, and to protect existing facilities and adjacent properties from damage from construction and demolition operations.

- B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
- 3.12 FENCING
- A. Construction - Commercial grade chain link fence.
  - B. Provide 8-foot high (min.) fence around construction site; equip with vehicular gates with locks.
- 3.13 EXTERIOR ENCLOSURES
- A. Provide temporary weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
  - B. Provide temporary tarps or other protection to roofs made open to weather by construction operations.
- 3.14 INTERIOR ENCLOSURES
- A. Provide temporary partitions to separate work areas from City occupied areas, to prevent penetration of dust and moisture into City occupied areas, to prevent damage to existing materials and equipment and as indicated.
  - B. Construction - Steel stud framing and gypsum board with closed joints and sealed edges at intersections with existing surfaces.
- 3.15 PROTECTION OF INSTALLED WORK
- A. Protect installed Work and provide special protection where specified in individual specification sections.
  - B. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
  - C. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by covering with durable sheet materials.
  - D. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
  - E. Prohibit traffic from landscaped areas.
- 3.16 SITE SECURITY
- A. The City assumes no responsibility for loss, theft, or damage to the work, tools, equipment, and construction. In the instance of any such loss, theft, or damage, the Contractor shall be responsible to renew, restore, or remedy the work, tools, equipment, and construction in accordance with requirements of the Contract Documents without additional cost to the City.
  - B. **The Contractor, at his own cost, may provide watchman services, and other means of site security.**
  - C. Site parked equipment, operable machinery, and hazardous parts of the new construction subject to mischief and accidental operation, shall be inaccessible, locked, or otherwise made inoperable when left unattended.
  - D. Liability - The City is not responsible for damage, liability, theft, casualty, or other hazard to the automobiles or other vehicles, nor to injury including death to occupants of automobiles or other vehicles on the City's property. Provide signs to this effect in the designated parking area.
- 3.17 ACCESS ROADS AND PARKING AREAS

- A. Access Roads
    - 1. Use existing roads on Site for access. Protect roads from damage from extra heavy loading by use of timbers or other approved means.
  - B. Parking Areas
    - 1. City will permit use of a designated area of the existing parking lot on the Site for exclusive parking of workmen's automobiles and of the automobiles of the Design Professional, Consultants, and other visitors having business at the Site.
- 3.18 PROJECT SIGN
- A Provide project identification sign, and temporary information and direction signs as required and approved. See Specification section 015800 for requirements.
- 3.19 TERMINATION AND REMOVAL
- A. Remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, but no later than Substantial Completion. Complete or restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.
  - B. Materials and facilities that constitute temporary facilities are property of the Contractor
  - C. Remove temporary paving that is not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that does not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances which might impair growth of plant materials or lawns. Repair or replace street paving, curbs and sidewalks at the temporary entrances, as required by the governing authority.

- END -

SECTION 015639  
TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.
- B. Related Requirements:
1. Section 024119 - Selective Demolition
  2. Section 312000 - Earth Moving
  3. Section 329300 - Plants

1.3 DEFINITIONS

- A. Caliper: Diameter of a trunk measured by a diameter tape at a height 6 inches above the ground for trees up to and including 4-inch size at this height and as measured at a height of 12 inches above the ground for trees larger than 4-inch size.
- B. Tree-Protection: Individual tree guard surrounding single tree trunk delineating area not to be disturbed during construction and indicated on drawings.
- C. Critical Root Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, as indicated on Drawings and defined by the drip line of individual trees or the perimeter drip line of groups of trees unless otherwise indicated.
- D. Diameter Breast Height (DBH): Diameter of a trunk as measured by a diameter tape at a height 54 inches above the ground line.
- E. Drip line: Outermost circumference of a tree canopy or the outermost extents of the collective canopy of a group of trees.
- F. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.



1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:
  - (a.) Tree-service firm's personnel and equipment needed to make progress and avoid delays.
  - (b.) Arborist's responsibilities.
  - (c.) Quality-control program.
  - (d.) Coordination of Work and equipment movement with the locations of protection zones.
  - (e.) Trenching by hand or with air spade within protection zones.
  - (f.) Field quality control.

## 1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Include plans, elevations, sections, and locations of protection-zone fencing and signage, showing relation of equipment-movement routes and material storage locations with protection zones.
2. Detail fabrication and assembly of protection-zone fencing and signage.
3. Indicate extent of trenching by hand or with air spade within protection zones.

C. Samples: For each type of the following:

1. Organic Mulch: 1-quart volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.

D. Arborist Report: Written report prepared by Certified Arborist for care and protection of trees affected by construction during and after completing the Work.

1. Report shall be submitted prior to any removals on site and shall include, but is not limited to: recommendations for soil amendments at existing trees to remain, watering (volume) during all work (at no additional cost to Owner), any required treatment for pests or disease, decompaction procedures within critical root zones, and any required root pruning. Soil amendment recommendations shall be coordinated with work of Section 329113 and shall include list of products, timing, and methodology.
2. Report shall include Tree Pruning Schedule with dates for such work. The written pruning schedule shall detail scope and extent of pruning for all trees to remain that interfere with or are affected by construction. Report shall include:
  - (a.) Species and size of tree.
  - (b.) Location on site plan. Include unique number identifier for each as shown in Contract Documents.
  - (c.) Reason for pruning.
  - (d.) Description of pruning to be performed.
  - (e.) Timing of pruning to be performed.
  - (f.) Description of maintenance by tree service firm following pruning.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For arborist and tree service firm.
- B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.
- C. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.
  - 1. Use sufficiently detailed photographs or video recordings.
  - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
  - 3. Identify any pests or disease as trees or other plants to remain that should be addressed in maintenance recommendations.
- D. Quality-control program.

## 1.7 QUALITY ASSURANCE

- A. Arborist Qualifications: Certified Arborist as certified by ISA.
- B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work. Tree service firm shall have experience working in plaza areas with tight conformance to grade conditions.
- C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection zone fencing, the arborist's and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

## 1.8 FIELD CONDITIONS

- A. The following practices are prohibited within protection zones:
  - 1. Storage of construction materials, debris, or excavated material.
  - 2. Moving or parking vehicles or equipment.
  - 3. Foot traffic.
  - 4. Erection of sheds or structures.
  - 5. Impoundment of water.
  - 6. Excavation or other digging unless otherwise indicated.
  - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

- B. Do not direct vehicle or equipment exhaust toward protection zones.
- C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Backfill Soil: Planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
  - 1. Planting Soil: Planting soil as specified in Section 329113 "Soil Preparation."
- B. Protection Fencing: Fencing fixed in position and meeting the following requirements:
  - 1. Tree Guard (Type 1): Fencing constructed of two 2-by-4-inch horizontal rails, with 4-by-4-inch preservative-treated wood posts spaced not more than 60 inches apart, and lower rail set 6 inches above existing grade. Plastic barrier fabric (color: orange) to be used as infill between posts.
    - (a.) Height: 48 inches.
  - 2. Critical Root Zone Protection (Type 2): Fencing constructed of 1 3/4" x 1" 13 GA U Channel steel posts. Plastic barrier fabric (color: orange) to be used as infill between posts.
    - (a.) Height: 48 inches
- C. Plastic Barrier Fabric: high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a minimum of 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with plastic bands or galvanized-steel or stainless-steel wire ties on protection fencing support system.
  - 1. Height: As required
  - 2. Color: High-visibility orange, nonfading

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

- B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

### 3.2 PREPARATION

- A. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Tie a 1-inch blue vinyl tape around each tree trunk at 54 inches above the ground.
- B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.
- C. Critical Root Zone Protection: Mulch areas inside critical root zone protection areas and other areas indicated. Do not exceed indicated thickness of mulch.
  - 1. Apply 4-inch uniform thickness of organic mulch unless otherwise indicated. Do not place mulch within 6 inches of tree trunks.

### 3.3 PROTECTION ZONES

- A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.
  - 1. Critical Root Zone Protection Fencing: Set or drive posts into ground to a minimum three (3) foot depth without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Owner's Representative.
- B. Tree Protection: Install guards under direct supervision of arborist. The intent of the guard placement is to allow hand removal of pavers without disturbing individual tree guard protection.
- C. Maintain protection zones free of weeds and trash.
- D. Maintain all protection zone fencing in good condition as acceptable to Owner's Representative or Landscape Architect and remove when construction operations are complete, and equipment has been removed from the site.
  - 1. Do not remove Tree Protection Fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
  - 2. Temporary access for activities such as hand removal of pavers is permitted within the critical root zone protection area, subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

### 3.4 EXCAVATION

- A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earth Moving" unless otherwise indicated.
- B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.
- C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.
- D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

### 3.5 SOIL DECOMPACTION AT EXISTING TREES

- A. Contractor shall follow direction on decompaction procedures within critical root zones of existing trees as described in Arborist's written report.

### 3.6 ROOT PRUNING

- A. Prune tree roots that are affected by temporary and permanent construction. Prune roots as follows, unless arborist has provided detailed written instructions specific to the trees at this location:
  - 1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
  - 2. Cut Ends: Coat cut ends of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other coating formulated for use on damaged plant tissues and that is acceptable to arborist.
  - 3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
  - 4. Cover exposed roots with burlap and water regularly.
  - 5. Backfill as soon as possible according to requirements in Section 312000 "Earth Moving"
- B. Root Pruning at Edge of Protection Zone: Prune tree roots 12 inches outside of the protection zone by cleanly cutting all roots to the depth of the required excavation.

- C. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

### 3.7 CROWN PRUNING

- A. Prune branches that are affected by temporary and permanent construction. Prune branches as directed by arborist.
  - 1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
  - 2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
  - 3. Pruning Standards: Prune trees according to ANSI A300 (Part 1).
- B. Unless otherwise directed by arborist and acceptable to Owner's Representative or Landscape Architect, do not cut tree leaders.
- C. Cut branches with sharp pruning instruments; do not break or chop.
- D. Do not paint or apply sealants to wounds.
- E. Provide subsequent maintenance pruning during Contract period as recommended by arborist.
- F. Chip removed branches and dispose of off-site.

### 3.8 REGRADING

- A. Lowering Grade within Protection Zones: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.
  - 1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.
- B. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone as recommended by arborist, unless otherwise indicated on drawings. Maintain existing grades within the protection zone.
- C. Temporary Minor Fill within Protection Zones: Where existing grade is 2 inches or less below elevation of finish grade, temporarily fill with specified soil. Place backfill soil in a single uncompacted layer and hand grade to required finish elevations.

### 3.9 FIELD QUALITY CONTROL

- A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

### 3.10 REPAIR AND REPLACEMENT

- A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Director's Representative.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to arborist's written instructions.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by Director's Representative.

- B. Trees: Remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition or are damaged during construction operations that Director's Representative determines are incapable of restoring to normal growth pattern.

1. Replacement Trees: Provide new trees of same size and species as those being replaced for each tree that measures 4 inches or smaller in caliper size.
2. Restitution Planting: Provide new tree(s) of 4-inch caliper size for each tree being replaced that measure more than 4 inches in caliper size. Provide one additional tree for each 4-inch caliper increment above 4". For example, a 6-inch caliper restitution credit would equal two (2) 4-inch caliper trees. Tree shall be planted at same location or elsewhere within park.

(a.) Species: As selected by Owner's Representative or Landscape Architect.

3. Plant and maintain new trees as specified in Section 329300 "Plants."

- C. Excess Mulch: Rake mulched area within protection zones, being careful not to injure roots. Rake to loosen and remove mulch that exceeds a 2-inch uniform thickness to remain. Do not place mulch within 6" of tree trunks.

- D. Soil Aeration: Where directed by Director's Representative, aerate surface soil compacted during construction. Aerate 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch- diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augured soil and sand.

### 3.11 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

END OF SECTION 015639



SECTION 01 5719  
ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractors requirement for protection of the atmosphere, waterways, groundwater, plants, animal habitats, soils, etc., both on and off site.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Earthwork in Division 2.

1.3 REGULATORY AGENCIES AND CODES

- A. Comply with the following in accordance with Division 1:
  - 1. United States Department of Agriculture (USDA)
  - 2. Urban Hydrology for Small Watersheds, Technical Release No. 55, Engineering Division, Soil Conservation Service.
  - 3. National Engineering Handbooks, Section 4 (Hydrology); Section 5 (Hydraulics); Section 16 (Drainage), Soil Conservation Service.
  - 4. City of Philadelphia

1.4 DEFINITIONS

- A. Sediment - Soil that has been eroded and transported by runoff water.
- B. Degradable Debris - Debris which can undergo biodegradation or combustion, or which can be dissolved in or suspended by water.
- C. Nondegradable Debris - Inorganic debris which will not disintegrate nor dissolve when exposed to moisture or water.
- D. Chemicals - Petroleum or cementitious products, bituminous materials, salts, acids, alkalis, herbicides and pesticides.
- E. Waste - Sewage, including domestic sanitary sewage, garbage, and trash.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Compost Sock: 5mil photo-degradable HDPE fabric, in-filled with weed-free, well-decomposed organic compost. Fabric sock "Siltsoxx" as manufactured by MCS Inc. ([www.mcsnjinc.com](http://www.mcsnjinc.com)) or approved equal.
- B. Silt Fences: Three (3) foot wide fabric designed to filter sediment, as manufactured by Mirafi, Inc. Amoco, or Exxon.
- C. Earth Stabilizer: Rye grass seed, hay, straw mulch, chemical stabilizer, or other devices approved by the environmental protection agency having jurisdiction and by the Design Professional.

- D. RipRap: Sizes as shown on drawings.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Establish and enforce ecological preservation measures which will avoid pollution of the atmosphere, waterways, groundwater, plants, soils, animal habitats, landfills, wetlands, the site, adjacent sites, roadways, etc.
- B. Prevent spilling of chemicals or waste. Provide emergency plans and methods for abatement of accidental spills of toxic substances.

### 3.2 SEDIMENT CONTROL

- A. Until permanent work establishes sediment control, provide temporary control, using vegetative cover with seeding, mulch, and binder within [ten (10)] days after completion of grading of any given area.
- B. As a temporary measure, provide silt fences, arranged along the toe of surface drainage ways and inlets, in such a manner that water will pass through the silt fences and filter the sediment. Embed silt fence in ground 6 inches deep and anchor to the ground with posts, as shown on the drawings. Replace silt fences when they become clogged and ineffective.
- C. During pipe laying work, prevent silt from entering the piping systems by use of hay bales, silt fence, temporary closures of pipe ends, or other means as best suited to the conditions.

### 3.3 CONTROLS DURING EARTH MOVING

- A. Perform earth moving in phases to minimize the area and extent of exposed land.
- B. Control the rate of water runoff by diversion ditches, benches, berms, and other earth-formed shaping so that the rate of flow is retarded and silting shall be minimized. Reshape and restore conditions showing evidence of earth erosion.

### 3.4 DUST CONTROL

- A. Keep dust down at all times, including non-working days, weekends, and holidays. Wet down or treat disturbed soil with dust suppressers as required and approved.
- B. Do not leave areas of disturbed earth unworked for long periods of time. Provide temporary or permanent earth stabilization promptly.
- C. In sandblasting operations, confine the dust.
- D. Use wet-cutting methods for cutting concrete, asphalt, and masonry.
- E. Do not shake out bags containing dust-causing substances.

### 3.5 NOISE CONTROL

- A. Provide mufflers on internal combustion engine equipment. Maximum noise level shall be 90 dbA at 50 feet.
- B. Where blasting is permitted, special permit and other requirements of the governing authorities regarding blasting shall govern.

- 3.6 C. Limit hours of operation of noisy construction to limits set by City

ordinance.

#### DISPOSAL OF DEBRIS, CHEMICALS AND WASTE

- A. Legally dispose of debris, chemicals, and waste off the site
- B. Collect and contain materials before disposal in orderly fashion and by means which prevent contamination of air, water and soil.
- C. Store chemicals in watertight containers.
- D. Do not burn materials on the site.

3.7

#### TRUCKS

- A. Dump trucks shall be tarpaulin-covered so that spillage does not occur.
- B. Provide a gravel surfaced truck wheel washing area at entrances. Clean all truck wheels of mud and debris before the trucks leave the site

3.8

#### MAINTENANCE AND TERMINATION

- A. Maintain in working order environmental protection measures until they are no longer required.
- B. Terminate environmental control measures when there is no longer a threat of pollution. Remove temporary control measures. Complete or, if necessary, restore permanent construction that may have been delayed or damaged because of interference with environmental controls.

- END -

## SECTION 01 5800

### PROJECT IDENTIFICATION AND SIGNS

#### PART 1 GENERAL

##### 1.1 DESCRIPTION OF WORK

Requirements include the following which shall be provided by the Contractor for General Construction:

- A. Furnish, install and maintain project identification sign.
- B. Provide temporary on-site information signs to identify Owner's temporary relocation.
- C. Remove signs on completion of construction.
- D. Allow no other signs to be displayed without approval of owner.

##### 1.2 RELATED REQUIREMENTS

- A. Section 011100 – Summary of Work
- B. Section 015000 – Temporary Facilities and Controls
- C. Section 0151719 – Environmental Controls

##### 1.3 PROJECT IDENTIFICATION SIGN

- A. Two (2) digitally printed signs, not less than 4 feet x 8 feet, with graphic content as shown on sample exhibit (1) on the next page of this section.
- B. Erect/Fasten on the site at location shown on drawing or as directed by the owner.

##### 1.4 INFORMATIONAL SIGNS

- A. Provide at all public entrances, stairways and temporary gates digitally printed signs with lettering indicating Owner's relocated address. Each sign to be 3 feet by 3 feet and up to 100 letters, with graphic content as shown on sample exhibit (2) on the next page of this section. Allow for a total of eight [8] signs.
- A. Erect/Install at appropriate locations to provide required information. Coordinate location with owner/owner's representative.

##### 1.5 QUALITY ASSURANCE

- A. Digital Sign Printer: Professional experience in type of work required.
- B. Finishes: Adequate to resist weathering and fading for scheduled construction period.

#### PART 2 PRODUCTS

##### 2.1 SIGN MATERIALS

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS

01 5800 –1

PROJECT IDENTIFICATION AND SIGNS

- A. Sign surfaces: Dibond material (aluminum sheets with plastic core).
  - 1. Thickness: at least 3 millimeters
- B. Hardware used to secure sign: Galvanized bolts with plastic fasteners.

### PART 3 EXECUTION

#### 3.1 PROJECT IDENTIFICATION SIGN

- A. Sign should be printed/manufactured with style, sizes and colors shown on exhibit attached on page 3 of this section.

#### 3.2 INFORMATION SIGNS

- A. Signs should be printed/manufactured in style, sizes and colors as shown in Exhibit 2
- B. Install at a height for optimum visibility, on ground-mounted poles or attached to temporary structural surfaces.

#### 3.3 MAINTENANCE

- A. Maintain signs, fasteners, and hardware in a neat, clean condition; repair damaged sign if needed.
- B. Relocate informational signs as required by progress of work.

#### 3.4 REMOVAL

- A. Remove signs, supports, fasteners at completion of project.

END OF SECTION

**Sample – Exhibit 1 - PROJECT IDENTIFICATION SIGN**



**Note for Sample - Exhibit 1 –**

City of Philadelphia and City Council logos are on ALL signs.

The following logos are dependent on project delivery and Owner (see below).


- PPR - only when site is a PPR site.
- FLP - only when site is a FLP site.
- PPR/FLP - need to show both when a co-located site exists.
- PHDC - logo used when project is being bid through PRA.
- Project User -logo used when project is bid through a Project User
- Funders – It may be required for funder logos to be included on the project sign. This will be at the direction of Rebuild.


**Sample – Exhibit 2 - INFORMATION SIGNS (PPR & FLP)**

OUR APOLOGIES  
FOR THE INCONVENIENCE

Programs at this site  
have temporarily  
relocated. To find your  
program's location,  
please visit:

Rebuild.Phila.gov



 (Name of Site)

PLEASE EXCUSE OUR APPEARANCE!

While we make physical  
improvements to this library, we  
have temporarily relocated  
library programing. To find your  
program's location, please visit:

libwww.freelibrary.org/locations/(LibraryLink)



 (Library Name)

**Note for Sample - Exhibit 2**

- PPR Info Sign - QR code to direct to the Rebuild.Phila.gov website
- FLP Info Sign – QR code to direct to the freelibrary.org website

SECTION 01 6001  
PRODUCTS AND MATERIALS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes administrative procedures regarding each Prime Contractor's selection of products, materials, and equipment required for the completion of the Work. Requirements for handling, storing and installing products are also included.

1.2 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties", "structure", "finishes", "accessories", and similar terms. Such terms are self-explanatory and have well recognized meanings in the construction industry.
- B. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material", "equipment", "system", and terms of similar intent.
- C. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature.
- D. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
- E. "Equipment" is a product with operational parts, whether motorized or manually operated, that require service connections such as wiring or piping.
- F. "System" is an integrated assembly of materials and/or equipment which when combined form an integral whole to serve a function.

1.4 QUALITY ASSURANCE

- A. Source Limitations - To the fullest extent possible, provide products of the same kind, from a single source.
- B. Compatibility of Options - When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- C. Each Prime Contractor is responsible for providing products and construction methods that are compatible with products and construction methods of other prime or separate Contractors.
- D. If a dispute arises between prime Contractors over concurrently selectable, but incompatible products, the Design Professional will determine which products shall be retained and which are incompatible and must be replaced.
- E. Nameplates - Except for required labels and operating data, do not attach or imprint manufacturer's or producer's nameplates or trademarks on exposed



surfaces of products which will be exposed to view in occupied spaces or on the exterior.

- F. Labels - Locate required product labels and stamps on a concealed surface or, where required for observation after installation, on an accessible surface that is not conspicuous.
- G. Equipment Nameplates - Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
  - 1. Name of product and manufacturer.
  - 2. Model and serial number.
  - 3. Capacity.
  - 4. Speed.
  - 5. Ratings.

#### 1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.
- B. Schedule delivery in accordance with the Construction Schedule and to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
- C. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
- D. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with legible labels and instructions for handling, storing, unpacking, protecting and installing.
- E. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
- F. Store products at the site in a manner that will facilitate inspection and measurement of quantity of counting of units.
- G. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
- H. Store product subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

#### 1.6 OPERATION, MAINTENANCE, TRAINING AND CALIBRATION

- A. Furnish manuals and services specified and as required to start-up, operate and maintain all equipment and systems.

### PART 2 PRODUCTS

#### 2.1 GENERAL PRODUCT REQUIREMENTS

- A. Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation. All products shall be certified asbestos-free.

- B. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
- C. Where the work requires testing for assurance of performance, that portion of the work shall not proceed until such testing has been completed and written test report has been approved.
- D. Do not use material or equipment for any purpose other than for which it is designed or specified.
- E. Certification of Compatibility: If indicated, the material and equipment manufacturers shall certify in writing that:
  - 1. Other manufacturer's materials or equipment coming into contact with their product are compatible with their product in every way and that the intended performance of the system in which their product is incorporated will not be affected as a result of such contact. Also, physical breakdown of their product by chemical reaction or otherwise will not occur as a result of such contact.
  - 2. The combination of products by one (1) manufacturer to make up the manufacturer's specified system, will contribute to the performance of the system as intended, and will remain operational, reliable and durable. The manufacturer will be the source of routine maintenance and replacement parts.
- F. Reuse of Existing Material
  - 1. Except where indicated or otherwise approved in writing, materials and equipment removed from an existing structure shall not be used in the work.
  - 2. Where use of existing material is indicated or approved, use special care in removing, handling, storing, and reinstallation to assure proper function in the completed work.

## 2.2 PRODUCT SELECTION PROCEDURES

- A. Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:
  - B. Where products or manufacturers are specified by name, description, or performance accompanied by the term "or equivalent substitution", "or approved substitution", "or approved equal" or similar terms comply with the Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
  - C. Proprietary Specification Requirements - Where products or manufacturers are named, provide the product indicated or submit a substitution request.
  - D. Descriptive Specification Requirements - Where Specifications describe a product or assembly, listing exact characteristics required, without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements. If descriptive specification also includes manufacturers or products, provide product indicated or submit a substitution request.
  - E. Performance Specification Requirements - Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. Compliance shall be certified by independent testing

agencies furnished by manufacturer. General overall performance of a product is implied where the product is specified for a specific application.

- F. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
- G. Compliance with Standards, Codes and Regulations - Where the Specifications require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified. Compliance shall be certified by independent testing agencies furnished by manufacturer.
- H. Visual Matching - Where Specifications require matching an established sample or existing construction, the Design Professional's decision will be final on whether a proposed product matches satisfactorily.
- I. Visual Selection - Where specified product requirements include the phrase "...as selected from manufacturer's standard colors, patterns, textures..." or a similar phrase, select a product and manufacturer that complies with other specified requirements. The Design Professional will select the color, pattern and texture from the product line selected.
- J. Allowances - Refer to individual Specification Sections and "Allowance" provisions in Division 1 for allowances that control product selection, and for procedures required for processing such selections.

### PART 3 EXECUTION

#### 3.1 ACCEPTABLE INSTALLERS

- A. Installers shall be familiar with products and experienced in their installation. Comply with more stringent requirements of individual sections for installer qualifications.

#### 3.2 EXAMINATION OF SUBSTRATE

- A. Each installer shall examine substrate onto which the product will be installed. Inspect for any condition which would in any way reduce the quality, performance or durability of the product including but not limited to; dimensional or location tolerances, dampness, dryness, installation not meeting specified criteria for substrate, poor workmanship, etc. Do not proceed with installation over unacceptable substrates. Notify Contractor to have substrate repaired. Work installed over unacceptable substrates shall be redone after substrate is repaired at no cost to the City.

#### 3.3 PREPARATION

- A. Protect adjacent work from possible damage which installation could cause including but not limited to staining, overspray, denting, gouging, displacement, etc.
- B. Clean and prepare substrates to receive products with primers, bonding agents, barrier coats, etc. as per manufacturer's instructions.

#### 3.4 PASSAGE OF MATERIALS AND EQUIPMENT

- A. Establish passage clearances required to deliver and install materials and equipment.

- B. Where there will be insufficient clearance for passage of materials and equipment, deliver and protect such equipment before confining construction is installed.
- C. If existing structures, equipment and systems must be altered to provide passage of new materials and equipment, engage those skilled in the respective trade to restore structures, equipment, and systems to their original condition at no additional cost. Do not alter structure, equipment, or systems without written approval.
- D. In lieu of altering structures to provide passage of materials and equipment, provide materials and equipment that can be disassembled, brought into the building, and reassembled.
- E. If exterior windows or doors must be removed to provide passage of materials and equipment into the building, store and protect removed work at the site and reinstall as soon as possible. If any damage occurs to the work during their removal, transit, storage or reinstallation, replace or repair the work to like new condition at no cost to Owner.

### 3.5 INSTALLATION

- A. Comply with manufacturer's instructions and recommendations and requirements of individual specification sections in the applications indicated. If manufacturer's instructions and specifications indicate differing installation techniques, request clarification from Design Professional but generally comply with more stringent requirement.
- B. Anchor each product securely in place accurately located and aligned with other Work.
- C. Coordinate installation with surrounding Work to allow for optimum end product.

### 3.6 FIELD QUALITY CONTROL

- A. Have manufacturer's technical representative on-site to observe crucial installation steps as required by individual specification sections or as required to meet manufacturer's warranty or to meet other indicated criteria.

### 3.7 ADJUSTING

- A. Adjust installed products for proper operation and fit.

- END -

SECTION 01 7123  
FIELD ENGINEERING

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. The General Contractor shall engage the services of a Surveyor to establish grades, lines and levels.
- B. Each separate Prime Contractor shall be responsible for layout of his own work, from grades, lines and levels established by the General Contractor.

1.2 RELATED REQUIREMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 QUALITY ASSURANCE

- A. Surveyor shall be licensed in the Commonwealth of Pennsylvania.

1.4 SUBMITTALS

- A. Submit name, address, and telephone number of Surveyor prior to starting survey work.
- B. On request, submit documentation verifying accuracy of survey work.
- C. Submit reference point survey including field notes for record.
- D. Submit certification, signed and sealed by the Surveyor showing that elevations and locations of all improvements are or are not in conformance with Contract Documents.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain complete, accurate log of control and survey work as it progresses.
- B. Record on record documents all pertinent information under provisions of Division 1.

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION

3.1 INSPECTION

- A. Verify locations of survey control points prior to starting work. Promptly notify Design Professional of any discrepancies discovered.

3.2 SURVEY REFERENCE POINTS

- A. Protect survey control points prior to starting site work; preserve permanent reference points during construction. Make no changes without prior written notice to Design Professional.
- B. Promptly report to Project Coordinator destruction of any reference point or relocation required because of changes in grades or other reasons. Replace dislocated survey control points based on original survey control.

3.3 SURVEY REQUIREMENTS

- A. Use instruments to establish a minimum of two (2) permanent bench marks on the site. Reference benchmarks to data established by survey control points. Record bench mark locations with horizontal and vertical data for Project Record Documents. Reference these benchmarks to finish floor lines. Provide accurate alignment and level of the work, and correct slope and curvatures as required.
- B. Periodically verify layouts by same means. No extra charges will be allowed for differences between dimensions shown and actual measurements. Advise the Project Coordinator of any differences.
- C. Prepare as-built site utility plan showing all utilities including stormwater, sanitary, water, gas and electric lines for permanent record.

- END -

SECTION 01 7329  
CUTTING, PATCHING, SLEEVES AND INSERTS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's cutting, fitting, patching, sleeves, and inserts required to complete the Work and to:
1. Make the parts come together properly.
  2. Uncover or remove portions of the Work to provide for installation of ill-timed work.
  3. Remove and replace defective work.
  4. Remove samples of installed work for testing as specified.
  5. Provide penetrations for installation of piping and electrical conduit.
  6. Repair surfaces shown to remain in the finished work, which are damaged in the process of demolition.
  7. Coordinate penetrations, sleeves, and inserts that are specified in one specification section and installed by another.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 REGULATORY REQUIREMENTS

- A. All cutting, fitting and patching shall be performed in compliance with governing code regulations relative to firestopping and smoke penetration.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Use materials that exactly match materials being cut or patched. If exact materials are not available, match with new materials with installed performance matching or exceeding cut or patched material. Comply with specifications and standards for each material involved.
- B. Sleeves and Inserts: as specified in the Trade Sections requiring inserts and sleeves for the installation of their work.

PART 3 EXECUTION

3.1 INSPECTION

- A. Inspect existing conditions, including work subject to damage or movement during cutting and patching.
- B. Report unsatisfactory conditions to the City. Do not proceed until directed.

3.2 PREPARATION

- A. Provide temporary support as required to maintain the structural integrity of work.

- B. Provide materials and methods to protect other work from damage, including exposure to the elements.

### 3.3 PERFORMANCE

- A. Do not cut or alter the work of another Prime Contractor without written consent of the City.
- B. Perform cutting of structural steel, structural concrete or load bearing unit masonry only after approval of the City.
- C. Execute cutting and demolition by methods that will prevent damage to other work, and provide proper surfaces to receive installation of repairs.
- D. Remove excess materials resulting from cutting and patching and dispose of legally off site.
- E. Perform excavating and backfilling by methods that will prevent settlement or damage to other work. Maintain excavations free of water.
- F. Where cutting and patching of materials provided under this Contract is required, employ the original installer or fabricator to perform cutting and patching of:
  - 1. Structural steel and concrete.
  - 2. Weather-exposed elements.
  - 3. Moisture- or corrosion-resistant elements.
  - 4. Sight-exposed finished surfaces.
- G. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- H. Restore work to remain, or be reused, which has been cut or removed. Install new products to provide complete work in accordance with Contract Documents.
- I. Refinish entire surface to provide an even finish to match adjacent surfaces. For continuous surfaces, refinish to nearest intersection. For an assembly, refinish the entire unit.
- J. Furnish sleeves and inserts required under individual specification sections to Contractor installing the Work to be sleeved or to have insert embedded. Be responsible for their correct location and installation.
- K. Penetrations required, but not shown on the Drawings, shall be cut into the work.

- END -



## SECTION 01 7419 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
  - 1. Salvaging nonhazardous demolition and construction waste.
  - 2. Recycling nonhazardous demolition and construction waste.
  - 3. Disposing of nonhazardous demolition and construction waste.

#### 1.02 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition and construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition and construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition and construction waste and subsequent incorporation into the Work.

#### 1.03 PERFORMANCE REQUIREMENTS

- A. General: Develop waste management plan that results in end-of-Project minimum rates for salvage/recycling of 75 percent by weight of total waste generated by the Work.
  - 1. Identify materials targeted for salvage and recycling.

#### 1.04 SUBMITTALS

- A. Waste Management Plan: Submit via Unifier within 7 days of date established for the Notice to Proceed.
  - 1. Plan shall identify the diversion goals of the project, relevant construction debris and materials diverted, implementation protocols, and parties responsible for implementation.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment,

submit via Unifier Include separate reports for demolition and construction waste. Include the following information:

1. Material category.
  2. Generation point of waste.
  3. Total quantity of waste in tons.
  4. Quantity of waste salvaged, both estimated and actual in tons.
  5. Quantity of waste recycled, both estimated and actual in tons.
  6. Total quantity of waste recovered (salvaged plus recycled) in tons.
  7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Waste Reduction Calculations: Before request for Substantial Completion, submit 3 copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- H. Qualification Data: For refrigerant recovery technician.
- I. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

#### 1.05 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to waste management.

## 1.06 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
  - 1. Include separate sections in plan for demolition and construction waste.
- B. Waste Identification: Indicate anticipated types and quantities of demolition and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
  - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
  - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
  - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
  - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
  - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

## **PART 2 - PRODUCTS (Not Used)**

## **PART 3 - EXECUTION**

### 3.01 PLAN IMPLEMENTATION

- A. General: Implement waste management plan as approved by Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.

- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
  - 1. Distribute waste management plan to everyone concerned within three days of submittal return.
  - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
  - 2. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

### 3.02 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers.
  - 3. Store items in a secure area until installation.
  - 4. Protect items from damage during transport and storage.
  - 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Not permitted on Project site.
- C. Salvaged Items for Owner's Use:
  - 1. Clean salvaged items.
  - 2. Pack or crate items after cleaning. Identify contents of containers.
  - 3. Store items in a secure area until delivery to Owner.
  - 4. Transport items to Owner's storage area designated by Owner.
  - 5. Protect items from damage during transport and storage.

### 3.03 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives

received for recycling waste materials shall accrue to Contractor.

- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.
  - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
    - a. Inspect containers and bins for contamination and remove contaminated materials if found.
  - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
  - 4. Store components off the ground and protect from the weather.
  - 5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

#### 3.04 RECYCLING DEMOLITION WASTE

- A. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.
- B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
- C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
  - 1. Clean and stack undamaged, whole masonry units on wood pallets.
- D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- E. Metals: Separate metals by type.
  - 1. Structural Steel: Stack members according to size, type of member, and length.
  - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- F. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- G. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- H. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
  - 1. Separate suspension system, trim, and other metals from panels and tile and sort

with other metals.

- I. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
  - 1. Store clean, dry carpet and pad (if present) in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- J. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- K. Plumbing Fixtures: Separate by type and size.
- L. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- M. Lighting Fixtures: Separate lamps by type and protect from breakage.
- N. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- O. Conduit: Reduce conduit to straight lengths and store by type and size.

### 3.05 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
  - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
  - 2. Polystyrene Packaging: Separate and bag materials.
  - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
  - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Site-Clearing Wastes: Chip brush, branches, and trees on-site or at landfill facility. Do not include land clearing debris such as soil, vegetation and rocks in LEED calculations.
- C. Wood Materials:
  - 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
  - 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
- D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

### 3.06 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
  2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

- END -

## SECTION 01 7423

### CLEANING

#### PART 1 GENERAL

##### 1.1 DESCRIPTION OF WORK

- A. This Section specifies each Prime Contractor's cleaning of the Work during construction and before completion.

##### 1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Additional cleaning is specified under the technical sections for that work.

#### PART 2 PRODUCTS

##### 2.1 MATERIALS

- A. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- B. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

#### PART 3 EXECUTION

##### 3.1 PERIODIC CLEANING

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
- B. Broom clean paved surfaces. Rake clean other surfaces of grounds. Remove snow and ice from access to building.
- C. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- D. Broom and vacuum clean interior areas prior to start of surface finishing and continue cleaning to eliminate dust.
- E. Collect and remove waste materials, debris, and rubbish from site at least weekly and dispose of legally off-site.
- F. Open free-fall chutes not permitted. Terminate closed chutes into appropriate containers with lids.
- G. Clean mechanical equipment, ductwork and replace filters as specified under Division 23.
- H. Clean electrical work including lighting fixtures as specified under Division 26.
- I. Maintain cleaning until Project or portion thereof is accepted by Certificate of Substantial Completion. If minor work is required after Substantial Completion, clean affected areas afterwards.

##### 3.2 FINAL CLEANING



- A. Immediately before observation of the Work for Substantial Completion, clean all sight-exposed surfaces. Clean all ledges and other horizontal or near horizontal surfaces that may not be sight-exposed but are contiguous to finished spaces.
- B. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
  - 1. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
  - 2. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

- END -

SECTION 01 7700  
CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section specifies each Prime Contractor's administrative and procedural requirements for project closeout.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 SUBSTANTIAL COMPLETION

- A. When the work is considered substantially complete, submit a written notice to the PRA that the Work, or a designated portion thereof, is substantially complete. Include a list of all items that require completion or correction.
- B. Within a reasonable time after receipt of such notice, an inspection by the PRA/City will be made to determine the status of completion.
- C. If the Work is not considered substantially complete; the Contractor will be notified in writing, giving the reasons therefore.
- D. Contractor shall remedy the deficiencies in the Work, and send a second written notice of substantial completion. This notice shall include a statement of action taken on each item noted as requiring correction or completion to achieve "Substantial Completion" status.
- E. The Work will be inspected a second time and if not considered substantially complete, the two steps in paragraphs A and B above will be repeated.
- F. When the PRA/City concurs that the Work is substantially complete, they will:
  - 1. Prepare a Certificate of Substantial Completion, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the PRA.
  - 2. Submit the Certificate to Contractor for written notice of the responsibilities assigned in the Certificate.
- G. Contractor shall prepare Application for Payment at Substantial Completion and complete administrative and submittal requirements per Section 012900 Payment Procedures.

1.4 FINAL OBSERVATION

- A. When the Work is considered complete, submit written certification that:
  - 1. Contract Documents have been reviewed.
  - 2. Work has been inspected by the Contractor and has been completed in compliance with Contract Documents.
  - 3. Equipment and systems have been tested in the presence of the Project Coordinator and are operational.
  - 4. Work is ready for final observation.
- B. Inspection by the PRA/City will be made to verify the status of completion with reasonable promptness after receipt of such certification.

- C. If the Work is not considered complete; the Contractor will be notified in writing, listing the incomplete or defective Work.
- D. Contractor shall take immediate steps to remedy the stated deficiencies, and, after correcting deficiencies, he shall send a second written certification that the Work is complete. This certification shall itemize each deficiency noted and a statement of action taken to remedy or complete the Work.
- E. The Work will be observed a second time and if not considered substantially complete, the two steps in paragraphs A and B above will be repeated.
- F. When the Work is acceptable under the Contract Documents, the Contractor shall be requested to make closeout submittals.

#### 1.5 ADDITIONAL OBSERVATION FEES

- A. Should more than two observations at substantial or final completion and/or for required mock ups be required due to failure of the Work to comply with the claims of status of completion made by the Contractor:
  - 1. PRA will compensate the Design Professional for such additional services.
  - 2. PRA will deduct the amount of such compensation from the final payment to the Contractor.

#### 1.6 CLOSEOUT SUBMITTALS

- A. When the Work is complete submit the following:
  - 1. Evidence of compliance with requirement of governing authorities as follows:
    - a. Certificate of Occupancy.
    - b. Certificates of Inspection for Work requiring Certificate of Inspection by governing authority.
    - c. Certificate and Reports of Inspection, Testing and Approval.
  - 2. Project Record Documents as specified under Division 1.
  - 3. Operation and Maintenance Manuals as specified under Division 1.
  - 4. Warranties as specified under Division 1.
  - 5. Keys and Keying Schedule as specified under Finish Hardware - Division 8.
  - 6. Spare Parts and Maintenance Materials as specified.
  - 7. Evidence of Payment and Release of Liens to the requirements of General and Supplementary Conditions.
  - 8. Requirements for Final Payment Application per Section 012900 Payment Procedures, Division 1.
  - 9. Consent of Surety.

#### 1.7 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Furnish spare parts and maintenance materials as specified under various Sections of the Specifications.
- B. Package and label parts and materials as directed and store in area of the building where directed by the PRA.

#### 1.8 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting.

- B. Statement shall reflect all adjustments to the Contract Sum:
    - 1. The original Contract Sum.
    - 2. Additions and deductions resulting from:
      - a. Previous Change Orders.
      - b. Change Orders caused by substitutions including deductions for review.
    - 3. Deductions for uncorrected Work.
    - 4. Deductions for re-inspection payments.
    - 5. Other adjustments.
    - 6. Total Contract Sum, as adjusted.
    - 7. Previous payments.
    - 8. Sum remaining due.
  - C. The PRA will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.
- 1.9 FINAL APPLICATION FOR PAYMENT
- A. Submit the final Application for Payment in accordance with procedures and requirements stated herein.

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION

- 3.1 Sample Certificate of Substantial Completion Form, see Project Coordinator for actual form.

– END –

SECTION 01 7823  
OPERATION AND MAINTENANCE MANUALS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's procedural requirements for compiling and submitting operation and maintenance data.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Individual Specifications Sections: Specific requirements for operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.4 FORMAT

- A. Prepare data in the form of an instructional manual.
- B. Binders: Commercial quality, 8-1/2 by 11 inch three ring binders with plastic covers. When multiple binders are used, correlate data into related consistent groupings.
- C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- D. Provide tabbed flyleaf, indexed for each separate product and system, with typed description of product and major component parts of equipment.
- E. Text: Manufacturer's printed data or typewritten data.
- F. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- G. Contents: Prepare a Table of Contents for each volume, with each Product or system description identified, in three parts as follows:
  - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Design Professional, Contractor, Subcontractors, and major equipment suppliers.
  - 2. Part 2: Operation and maintenance instructions arranged by system and subdivided by specification section. For each category, identify names, addresses and telephone numbers of Subcontractors and suppliers. Identify the following:
    - a. Significant design criteria.
    - b. List of equipment.
    - c. Parts list for each component.
    - d. Operating instructions.
    - e. Maintenance equipment for equipment and systems.

- f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
- 3. Part 3 - Project documents and certificates, including the following:
  - a. Shop drawings and product data.
  - b. Air and water balance reports.
  - c. Certificates.
  - d. Photocopies of warranties and bonds.
- H. Data
  - 1. For Each Product or System - List names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.
  - 2. Product Data - Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.
  - 3. Drawings - Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawing.

#### 1.5 MANUAL FOR MATERIALS AND FINISHES

- A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: As specified in individual Product Specification sections.

#### 1.6 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- B. Panelboard Circuit Directories - Provide electrical service characteristics, controls, and communications.
- C. Include color-coded wiring diagrams  
as installed.
- D. Operating Procedures - Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

- F. Troubleshooting: Include step-by-step chart listing common problems with appropriate repairs.
- G. Provide servicing and lubrication schedule, and list of lubricants required.
- H. Include manufacturer's printed operation and maintenance instructions.
- I. Include sequences of operation by controls manufacturer.
- J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Provide control diagrams by controls manufacturer as installed.
- L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Include test and balancing reports as specified.
- O. Additional Requirements - As specified in individual Product specification sections.
- P. Where the complexity of machinery is such that regular maintenance by a specialty service company is normal, or may be required by law, give notice thereof in writing.

#### 1.7 INSTRUCTION OF CITY PERSONNEL

- A. Before final inspection, instruct City's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times.
- B. For equipment requiring seasonal operation, perform instructions for other seasons within two (2) months.
- C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- D. Prepare and insert additional data in Operation and Maintenance Manual when need for such data becomes apparent during instruction.

1.8 SUBMITTALS

- A. For equipment, or component parts of equipment put into service during construction and operated by City, submit documents within ten days after acceptance.
- B. Submit 2 copies of completed volumes fifteen (15) days prior to final inspection. This copy will be reviewed and returned after final observation, with comments. Revise content of all document sets as required prior to final submission.
- C. Submit six (6) sets of revised final volumes in final form prior to or coincidental with Final Application for Payment.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION Not Used

- END -+



## SECTION 01 7836

### WARRANTIES

#### PART 1 GENERAL

##### 1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's procedural requirements for executing, assembling and submitting warranties.

##### 1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Individual Specification sections requiring warranties or service/maintenance contracts.

##### 1.3 SUBMITTAL REQUIREMENTS

- A. Submit two (2) sets of original signed copies of warranties, bonds, service and maintenance contracts, executed by the respective manufacturers, suppliers, and subcontractors.
- B. Contents - Neatly type, in orderly sequence, the following information for each item.
  - 1. Product or work item.
  - 2. Subcontractor supplier and manufacturers names, addresses, and telephone numbers.
  - 3. Date of beginning and duration time of warranty, bond, or service and maintenance contract.
  - 4. Proper procedure in case of failure.
  - 5. Instances which might affect the validity of warranty or bond.
- C. Bind each set in 8 1/2 inch by 11 inch commercial quality, three-ring binders with plastic covers. Identify each binder with typed or printed title "Warranties" with title of project and location.

##### 1.4 TIME OF SUBMITTALS

- A. For equipment or component parts of equipment placed into service during progress of construction, submit documents within ten (10) days after inspection and acceptance.
- B. Make other submittals within ten (10) days after Date of Substantial Completion, prior to final request for payment.
- C. For items of work, where acceptance is delayed materially beyond the Date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing the date of acceptance as the start of the warranty period.

PART 2 PRODUCTS            Not Used

PART 3 EXECUTION        Not Used

- END -

SECTION 01 7839  
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

- A. This Section describes each Prime Contractor's administrative and procedural requirements for recording final product and material selections, changes to the Contract, and recording Work concealed by subsequent construction.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.3 MAINTENANCE OF DOCUMENTS

- A. Maintain at job site, one (1) copy of record documents including Drawings, Specifications, Addenda, Change Orders and other modifications, Shop Drawings, product data and samples.
- B. In addition, maintain one (1) copy of field orders or written instructions, field test records, testing and inspection reports, progress reports, meeting minutes and construction photographs.
- C. Maintain documents in a clean, dry, legible condition and in good order.
- D. Make documents available at all times for inspection.
- E. Review documents at progress meetings.

1.4 RECORDING

- A. Neatly label each document and binder with "Project Record" and project name and location.
- B. Record information concurrently with construction progress.
- C. Do not conceal any work until required information is recorded.
- D. Record Construction Drawings and Shop Drawings: Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
  - 1. Note horizontal and vertical locations of concealed elements, referenced to permanent, visible features.
  - 2. Note field changes of dimension and detail.
  - 3. Note details not on original Contract Drawings.
- E. Record Project Manual: Mark to show substantial variations in actual Work performed in comparison with the text of the original. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.
- F. Record Product Data: Maintain one copy of each Product Data submittal. Mark documents to show significant variations in actual Work performed in comparison with information submitted. Give particular attention to concealed products and

portions of the Work that cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.

1.5 SUBMITTALS

- A. Preceding or coincidental with the final pay application, submit the following:
- B. Record Construction Drawings: One (1) set of reproducible Mylar transparencies showing all clearly-indicated notations specified above, and including notation "AS BUILT DRAWINGS" with submission date and General Contracting company's information grouped together near the titleblock's original date. Transparencies of the Design Professional's drawings may be used for this purpose upon reimbursement of the printing costs to the Design Professional.
- C. Record Shop Drawings: One (1) copy of any shop drawings.
- D. Record Project Manual: One (1) copy bound in 3 ring binder(s).
- E. Record Product Data: One (1) copy organized by CSI format bound in 3 ring binder(s).
- F. If review of Record Documents reveals noncompliance with Contract Documents, errors or omissions, Contractor shall correct deficiencies and resubmit.

PART 2 PRODUCTS                      Not Used

PART 3 EXECUTION                      Not Used

- END -

SECTION 019113  
GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies the Contractor's responsibilities in the commissioning process. Commissioning requires the participation of the Contractor to ensure that all systems are operating in a manner consistent with the Contract Documents.
- B. The commissioning process integrates the traditionally separate functions of system documentation, equipment startup, performance testing and training. Commissioning during the construction phase is intended to achieve the following specific objectives in accordance with the Contract Documents:
  - 1. Verify and document that applicable equipment and systems are installed according to the manufacturer's recommendations, contract requirements, and industry standards and that they receive adequate operational checkout by installing contractors.
  - 2. Verify and document proper performance of equipment and systems.
  - 3. Verify and document that O&M documentation is complete.
  - 4. Verify and document that the Facility operating personnel are properly trained.
- C. The systems and equipment to be commissioned are listed in this Section. The Contractor's general commissioning requirements and coordination are detailed in this Section. Specific requirements for commissioning of each system or piece of equipment are detailed in the specification Section for the individual systems or pieces of equipment. A detailed description of the overall commissioning process is included in the appendix.
- D. The commissioning process does not reduce the responsibility of the Contractor to provide finished and fully functional systems and equipment.

1.02 SYSTEMS TO BE COMMISSIONED

- A. Refer to the individual commissioning specifications, plumbing, electrical, and mechanical for the systems to be commissioned.
  - a. New Building Automation Systems (BAS) - interface with the new BAS equipment.
  - b. New HVAC Systems and Distribution
  - c. New Domestic Systems – new gas fired water heater, circulator pump, plumbing fixtures.
  - d. New Playground Sprinkler System
  - e. New Lighting Control Systems
  - f. New Power Distribution
- B. Equipment and system specific Pre-Functional Checklists and Functional Test procedures will be developed by the Commissioning Provider based on approved submittals, and then will be provided to the Contractors.

1.03 DEFINITIONS

- A. Acceptance Phase: Phase of construction after startup and initial checkout when functional performance tests, O&M documentation review and training occurs.

- B. Approval: Acceptance that a piece of equipment or system has been properly installed and is functioning in the tested modes in accordance with the Contract Documents.
- C. Commissioning Provider (CxA, CCP): An independent agent responsible for the direction and coordination of the commissioning activities. The CxA responsible to the Owner's Representative.
- D. Commissioning Plan: An overall plan that provides the structure, schedule and coordination planning for the commissioning process.
- E. Commissioning Team: The members of the commissioning team consist of the Commissioning Authority, the Owner's Representative, the Contractor, the architect and design engineers. The owner and the building or plant operator/engineer also may be members of the commissioning team.
- F. Deferred Functional Tests: Functional tests that are performed after substantial completion, due to partial occupancy, seasonal requirements, design or other site conditions that prevent the test from being performed prior to substantial completion.
- G. Deficiency: A condition in the installation or function of a component, piece of equipment or system that is not in compliance with the Contract Documents.
- H. Factory Testing: Testing of equipment on-site or at the factory by factory personnel.
- I. Functional Performance Test (FT-FPT): Test of the dynamic function and operation of equipment and systems using manual (direct observation) or monitoring methods. Functional testing is the dynamic testing of systems (rather than just components) under full operation. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc. The CxA develops the functional test procedures in sequential written form. The CxA coordinates, oversees and documents the actual testing. The Contractor performs the functional tests. FTs are performed after pre-functional checklists and startup are complete.
- K. Pre-functional Checklist (PC): A list of items to inspect and component tests to conduct to verify proper installation of equipment prior to initiating functional testing.
- L. Startup: The initial starting or activating of dynamic equipment, including executing pre-functional checklists.

#### 1.04 COORDINATION

- A. The CxA is hired by, and works for, the Owner. The CxA directs and coordinates the commissioning activities. All members of the commissioning team shall work together to fulfill their contractual responsibilities and meet the objectives of the Contract Documents.
- B. The CxA will work with the Contractor according to established protocols to schedule the commissioning activities. The Contractor shall integrate all commissioning activities into the approved progress schedule. All parties will address scheduling problems and make necessary notifications and changes in a timely manner in order to expedite the commissioning process and maintain the approved progress schedule.

#### 1.05 COMMISSIONING PROCESS

- A. Commissioning Plan. The commissioning plan provides guidance in the execution of the commissioning process. Following the initial commissioning scoping meeting the CxA

will update the plan which is then considered the “final” plan, although it may be revised as the project progresses.

- B. Commissioning Process. The following narrative provides a brief overview of the typical commissioning tasks during construction and the general order in which they occur.
1. Commissioning during construction begins with a scoping meeting conducted by the CxA where the commissioning process is reviewed with the Commissioning Team.
  2. Additional meetings will be required throughout construction, scheduled by the Owner's Representative, to plan, scope, coordinate, and schedule future activities and to resolve problems. When possible, commissioning meetings will be scheduled immediately following construction meetings.
  3. Equipment documentation is submitted to the CxA during the submittal process, including detailed start-up procedures.
  4. The CxA works with the Contractor to develop startup activity lists and startup documentation. The CxA provides pre-functional checklists to be completed by the installing contractors prior to the startup process.
  5. In general, the checkout and performance verification proceeds from simple to complex; from component level to equipment to systems and intersystem levels. In each case pre-functional checklists are completed, submitted, and approved before functional testing begins.
  6. The CxA and Contractor executes and documents the pre-functional checklists, and provides notification to the Owner's Representative. The Contractor performs startup. The CxA documents that the startup was completed according to the approved plans.
  7. The CxA develops specific equipment and system functional performance test procedures. The Contractor reviews the procedures and submits suggestions or comments. Procedures are finalized by the CxA.
  8. The procedures are executed by the Contractor, under the direction of the CxA.
  9. Items of non-compliance in material, workmanship, or setup are corrected and retested at the Contractor's expense. The Contractor is responsible for providing all resources, manpower, and materials necessary to rectify deficiencies as per requirements of the approved schedule.
  10. The O&M documentation prepared by the Contractor is reviewed for completeness by the CxA.
  11. Commissioning is completed before Substantial Completion.
  12. The CxA reviews, pre-approves and coordinates the training provided by the Contractor and verifies that it was completed.
  13. Deferred testing is conducted, as specified or required.

## 1.06 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor's commissioning responsibilities are as follows (all references apply to commissioned systems and equipment only):
1. Construction and Acceptance Phase:
    - a. Attend the commissioning scoping meeting and other necessary meetings scheduled by the Owner's Representative to facilitate the commissioning process.
    - b. Facilitate the coordination of the commissioning work by the CxA, and with the CxA ensure that commissioning activities are being scheduled into the approved progress schedule.
    - c. Provide detailed manufacturer installation and start-up, operating, troubleshooting and maintenance procedures, factory test reports, and full warranty information, including all responsibilities of the Owner to keep the warranty in force. The installation, start-up and checkout

materials that are actually shipped with the equipment and the actual field checkout sheet forms to be used by the factory or field technicians shall be submitted to the CxA. The CxA may request further documentation necessary for the commissioning process.

- d. In each purchase order or subcontract written, include requirements for submittal data, O&M data, commissioning tasks and training.
- e. Ensure that all subcontractors execute their commissioning responsibilities according to the Contract Documents and approved progress schedule.
- f. Assist in the process of writing detailed test procedures by clarifying the operation and control of commissioned equipment.
- g. Review test procedures to ensure feasibility, safety and equipment protection and provide necessary written alarm limits to be used during the tests.
- h. Develop a full start-up and testing plan using manufacturer's start-up procedures and the pre-functional checklists from the CxA for all commissioned equipment. Submit to the CxA for review and approval prior to startup.
- i. During the startup and initial checkout process, execute all portions of the pre-functional checklists for all commissioned systems and equipment. Verify that system installations include all ports, gages, thermometers, access doors, valves, etc., required for specified functional performance testing.
- j. Provide all special tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment.
- k. Perform and clearly document all completed startup and system operational checkout procedures, providing a copy to the CxA.
- l. Address incomplete Work before functional performance testing.
- m. Provide skilled technicians to execute startup of equipment and to execute the functional performance tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.
- n. Provide skilled technicians to perform functional performance testing under the direction of the CxA for specified equipment. Provide Manufacturer's Representative as required and as specified in the Specification. Assist the CxA in interpreting the monitoring data, as necessary.
- o. Correct deficiencies (differences between specified and observed performance) as directed by the CxA or Owner's Representative.
- p. Prepare O&M manuals according to the Contract Documents, including clarifying and updating the original sequences of operation to as-built conditions. Provide a copy of the O&M manuals and submittals of commissioned equipment to the CxA for review and approval.
- q. Provide training as specified.
- r. Coordinate with equipment manufacturers to determine specific requirements to maintain the validity of the warranty.

2. Warranty Period:

- a. Execute seasonal or deferred functional performance testing in accordance with the specifications
- b. Correct deficiencies and make necessary adjustments to O&M manuals and as-built drawings for applicable issues identified in any seasonal testing.

## PART 2 - PRODUCTS

### 2.01 TEST EQUIPMENT

- A. All standard testing equipment required to perform startup and initial checkout and required functional performance testing shall be provided by the Contractor.
- B. Specified special equipment, tools and instruments (only available from vendor, specific to a piece of equipment) required for testing equipment shall be provided by the Contractor, and turned over to the facility at the completion of the Work.
- C. Datalogging equipment and software required to test equipment will be provided by the Contractor, but shall not become the property of the Owner's Representative.
- D. All testing equipment shall be of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified in the Specifications. All equipment shall be calibrated according to the manufacturer's recommended intervals. Calibration tags shall be affixed or certificates readily available.

## PART 3 - EXECUTION

### 3.01 MEETINGS

- A. Scoping Meeting. Prior to the commencement of construction, the CxA will schedule, plan and conduct a commissioning scoping meeting with the Commissioning Team.
- B. Miscellaneous Meetings. Other meetings will be planned and conducted by the CxA as construction progresses. These meetings will cover coordination, deficiency resolution and planning issues with the Contractor, appropriate sub-contractors and suppliers, the Owner's Representative, and the Owner's Representative.

### 3.02 START-UP, PRE-FUNCTIONAL CHECKLISTS, AND INITIAL CHECKOUT

- A. Pre-functional checklists and initial checkout shall ensure that the equipment and systems are hooked up and operational. Each piece of equipment receives full pre-functional checkout. No sampling strategies are used. The pre-functional testing for a given system must be successfully completed prior to formal functional performance testing of systems or equipment.
- B. Start-up and Initial Checkout Plan. The CxA shall assist the commissioning team members responsible for startup of any equipment in developing detailed start-up plans for all equipment. The primary role of the CxA in this process is to ensure that there is written documentation that each of the manufacturer's recommended procedures have been completed.
- C. Execution of Pre-functional Checklists and Startup.
  - 1. Pre-functional checklists must be completed and returned to the CxA for verification prior to startup. Prior to startup, the Contractor shall schedule startup and checkout with the Owner's Representative.
  - 2. The Contractor shall execute startup and provide the CxA with a signed and dated copy of the completed start-up and pre-functional tests and checklists.

### 3.03 FUNCTIONAL PERFORMANCE TESTING

- A. Development of Test Procedures. Using the requirements in the specifications, the CxA shall develop specific test procedures and forms to verify and document proper operation



of each piece of equipment and system. The Contractor shall provide assistance to the CxA in developing the procedures. Prior to testing, the CxA shall provide a copy of the test procedures to the Contractor who shall review the tests for feasibility, safety, equipment and warranty protection.

- B. Functional performance testing shall document that each system is operating in accordance with the Contract Documents. During the testing process, areas of deficient performance shall be identified. Deficiencies shall be corrected by the Contractor and functional testing shall be re-scheduled. The Contractor shall be responsible for all costs associated with re-testing for functional performance.
- C. Each system shall be operated through all modes of operation. Proper responses to such modes and conditions as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc. shall also be tested.
- D. Test Methods. Each function and test shall be performed under conditions that simulate actual conditions as closely as possible. The Contractor shall execute the test and shall provide all necessary materials, system modifications, etc. to produce the necessary flows, pressures, temperatures, etc. necessary to execute the test according to the specified conditions. At the completion of the test, the Contractor shall return all building equipment and systems affected by these temporary modifications to their pre-test condition.

#### 3.04 OPERATION AND MAINTENANCE MANUALS

- A. Standard O&M Manuals. The specific content and format requirements for the standard O&M manuals are detailed in Specifications
- B. The Contractor shall compile and prepare commissioning documentation for all equipment and systems and include this information in the O&M manuals.

#### 3.05 TRAINING

- A. The Contractor shall be responsible for coordinating, scheduling, and documenting that all required training has been completed successfully.
- B. The Contractor shall have the following training responsibilities:
  - 1. Provide a training plan two weeks before the planned training.
  - 2. Provide comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of equipment.
  - 3. Training shall normally start with classroom sessions followed by hands-on training on each piece of equipment.
  - 4. The training sessions shall follow the outline in the Table of Contents of the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
  - 5. Training shall include:
    - a. Use of the printed installation, operation and maintenance instruction material included in the O&M manuals.
    - b. A review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, and any emergency procedures.
    - c. Discussion of relevant health and safety issues and concerns.
    - d. Discussion of warranties and guarantees.
    - e. Common troubleshooting problems and solutions.

- f. Explanatory information included in the O&M manuals and the location of all plans and manuals in the facility.
- g. Discussion of any peculiarities of equipment installation or operation.

### 3.06 DEFERRED TESTING

- A. Unforeseen Deferred Tests. If any check or test cannot be completed due to project conditions, required occupancy condition or other deficiency, execution of checklists and functional testing may be delayed upon approval of the Owner's Representative. These tests will be conducted in the same manner as the seasonal tests as soon as possible.
- B. Seasonal Testing. Seasonal testing (tests delayed until weather conditions are closer to the system's design conditions) shall be completed as part of this contract. Make any final adjustments to the O&M manuals and as-builts resulting from information gained during testing.

END OF SECTION

## PART 1 - GENERAL

### 1.1 SUMMARY

#### A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

#### B. Related Requirements:

1. Section 011000 "Summary" for restrictions on use of the premises, Owner-occupancy requirements, and phasing requirements.
2. Section 015639 "Temporary Tree and Plant Protection" for temporary protection of existing trees and plants that are affected by selective demolition.
3. Section 017300 "Execution" for cutting and patching procedures.
4. Section 311000 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.

### 1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to owner for reuse.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

### 1.3 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

#### 1.4 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at project site, 300 W. Shunk Street, Philadelphia, PA 19148.
  1. Inspect and discuss condition of construction to be selectively demolished.
  2. Review structural load limitations of existing structure.
  3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
  5. Review areas where existing construction is to remain and requires protection.

#### 1.5 INFORMATIONAL SUBMITTALS

- A. Engineering Survey: Submit engineering survey of condition of site improvements.
- B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- C. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.
- D. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- E. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

#### 1.6 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

#### 1.7 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

## 1.8 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Engineer of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.
  - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  - 1. Maintain fire-protection facilities in service during selective demolition operations.

## 1.9 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
  - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- C. Survey of Existing Conditions: Record existing conditions by use of measured drawings preconstruction photographs or video.
  - 1. Inventory and record the condition of items to be removed and salvaged.

### 3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
  - 2. Arrange to shut off utilities with utility companies.
  - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  - 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
    - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

- f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
- g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

### 3.3 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
  - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.
- C. Remove temporary barricades and protections where hazards no longer exist.

### 3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
  - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents

- of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least **<Insert number>** hours after flame-cutting operations.
  6. Maintain adequate ventilation when using cutting torches.
  7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  10. Dispose of demolished items and materials promptly. Comply with requirements in Section 017419 "Construction Waste Management and Disposal."
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- C. Removed and Salvaged Items:
1. Clean salvaged items.
  2. Pack or crate items after cleaning. Identify contents of containers.
  3. Store items in a secure area until delivery to Owner.
  4. Transport items to Owner's storage area on-site.
  5. Protect items from damage during transport and storage.
- D. Removed and Reinstalled Items:
1. Clean and repair items to functional condition adequate for intended reuse.
  2. Pack or crate items after cleaning and repairing. Identify contents of containers.
  3. Protect items from damage during transport and storage.
  4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and reinstalled in their original locations after selective demolition operations are complete.
- 3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS
- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least **3/4 inch (19 mm)** at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.



Issue for Bid

- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
- C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction. and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."
  - 1. Do not allow demolished materials to accumulate on-site.
  - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.8 SELECTIVE DEMOLITION SCHEDULE

- A. Remove: Existing site features marked for removal on the plans.
- B. Existing to Remain: Existing site features to remain as noted on the plans.

END OF SECTION 024119

SECTION 02 4120  
SELECTIVE DEMOLITION - BLDG

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

- A. This section describes each Prime Contractor's requirements for:
  - 1. Selective removal and subsequent disposal of portions of existing building indicated on drawings and as required to accommodate new construction.
  - 2. Salvage of existing fixtures, materials, and equipment indicated.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.03 SUBMITTALS

- A. Schedule: Indicate proposed sequence of operations for selective demolition Work.
  - 1. Include coordination for shut-off, capping, and continuation of utility services.
  - 2. Indicate provisions for dust and noise control.
  - 3. Provide detailed sequence of demolition work to ensure uninterrupted progress of City's site operations.
  - 4. Coordinate with City's continuing occupation of portions of existing building and site with City's partial occupation of completed phases.
  - 5. Submit for review before commencing selective demolition.
- B. Photographs - Submit photographs of existing conditions that might be misconstrued as damage related to selective demolition operations.

1.04 JOB CONDITIONS

- A. Condition of Structures: City assumes no responsibility for actual condition of items or structures to be demolished.
  - 1. City will maintain conditions existing at time of inspection for bidding purposes insofar as practical. Minor variation within structure may occur by City's removal and salvage operations prior to start of selective demolition.
- B. Damages: Repair damages caused to adjacent facilities by selective demolition work.
- C. Traffic: Conduct selective demolition operations and debris removal to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities.
  - 1. Do not close, block, or obstruct streets, walks, or other occupied or used facilities without prior written permission from authorities having jurisdiction. Provide alternate routes if required.
- D. Flame Cutting: Do not use open flame in occupied spaces. Verify area is clear of flammable materials before flame cutting. Maintain portable fire extinguishers while flame cutting.
- E. Utility Services: Maintain existing utilities indicated to remain and protect them against damage during demo operations.

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS - PACKAGE #2

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SELECTIVE DEMOLITION

1. Do not interrupt utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions.
2. Maintain fire protection services during selective demolition.

F. Environmental Controls: Limit dust and dirt migration.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION

3.01 PREPARATION

- A. Protections: Provide temporary barricades and other forms of protection to protect City personnel and general public from injury due to selective demolition.
1. Provide measure to allow free and safe passage of City personnel and general public to occupied portion of the building.
  2. Provide shoring, bracing, and temporary supports to prevent movement, settlement, or collapse of structure or element to be demolished and adjacent construction to remain.
  3. Protect existing construction that is to remain from damage.
  4. Erect temporary partitions to separate areas of noisy or dusty demolition.
  5. Provide temporary weather protection during interval between selective demolition operations which exposes interior of building to weather or water and subsequent construction
- B. Utilities: Locate, identify, stub off, and disconnect utility services that are not indicated to remain.

3.02 SELECTIVE DEMOLITION

- A. Remove portions of the existing as shown on drawings in manner for the new work to be installed and protecting the existing to remain.
- B. Recycle all materials removed in ascendance to City regulations.

3.03 DEMOLITION OF STRUCTURES where shown on drawings

- A. General: Perform selective demolition work in systematic manner and approximately in reverse order of construction. Comply with demolition plan and governing regulations.
1. Demolish foundation walls to minimum 12 inches below ground surface. Demolish and remove below-grade wood or metal construction. Break up below grade concrete slabs.
  2. Remove complete slab-on-grade in areas indicated for selective demolition.
  3. Saw cut slab-on-grade as required to remove indicated utilities and for new construction.

3.04 MATERIALS

- A. Salvage Items: Where indicated on drawings as "SALVAGE" carefully remove indicated items, clean, store, and turn over to City at location directed on-site.
- B. All materials resulting from selective demolition operations except where indicated as salvaged shall become the property of the Contractor. Remove from site and dispose of legally. Burning of materials is not allowed.

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SELECTIVE DEMOLITION

3.05 CLEANUP AND REPAIR

- A. General: Upon completion of demolition work, remove temporary facilities and all demolished materials. Leave interior spaces and site broom clean.
- B. Repairs: Repair demolition performed in excess of that required or indicated. Return elements of construction and surfaces to remain to condition existing prior to start of operations.

END OF SECTION 02 4119

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## SECTION 03 0100 MAINTENANCE OF CONCRETE

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Scope of Work: As indicated on drawings for the following:
- B. Cleaning of existing concrete surfaces.
- C. Repair of exposed structural, shrinkage, and settlement cracks.
- D. Resurfacing of concrete surfaces having spalled areas and other damage.
- E. Repair of deteriorated concrete.
- F. Repair of internal concrete reinforcement.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Finishing of concrete surface to tolerance; floating, troweling, and similar operations; curing.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars 2022.
- B. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement 2016.
- C. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2018.
- D. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2021.
- E. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens) 2021.
- F. ASTM C150/C150M - Standard Specification for Portland Cement 2022.
- G. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars 2021.
- H. ASTM C404 - Standard Specification for Aggregates for Masonry Grout 2018.
- I. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete 2020a.
- J. ASTM C928/C928M - Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs 2020a.
- K. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete 2021.
- L. ASTM C1708/C1708M - Standard Test Methods for Self-leveling Mortars Containing Hydraulic Cements 2019.

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MAINTENANCE OF CONCRETE

- M. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars 2018, with Amendment (2020).
- N. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair 2013.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturers' instructions for storage, shelf life limitations, and handling of products.

### PART 2 PRODUCTS

#### 2.01 CLEANING MATERIALS

- A. Degreaser:
  - 1. Manufacturers:
    - a. Euclid Chemical Company; Euco Clean and Strip: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - b. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; CITREX: [www.lmcc.com/#sle](http://www.lmcc.com/#sle).
    - c. Nox-Crete, Inc; Bio-Clean Plus: [www.nox-crete.com/#sle](http://www.nox-crete.com/#sle).
    - d. SpecChem, LLC; Orange Peel-Citrus Cleaner: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - e. United Gilsonite Laboratories; DRYLOK® Concrete Cleaner and Degreaser: [www.ugl.com/#sle](http://www.ugl.com/#sle).
    - f. W. R. Meadows, Inc: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- B. Detergent: Non-ionic detergent.
- C. Alkaline Cleaning Agent: as recommended.
- D. Acidic Cleaning Agent:
  - 1. Manufacturers:
    - a. United Gilsonite Laboratories; DRYLOK® Concrete and Masonry Etch and Cleaner: [www.ugl.com/#sle](http://www.ugl.com/#sle).
- E. Strippers and Cleaners for Removal of Existing Coatings:
  - 1. Manufacturers:
    - a. Nox-Crete, Inc; Deco-Strip Series: [www.nox-crete.com/#sle](http://www.nox-crete.com/#sle).
    - b. Nox-Crete, Inc; Deco-Peel Series: [www.nox-crete.com/#sle](http://www.nox-crete.com/#sle).

- F. Blasting Medium: as required and allowed.

## 2.02 CEMENTITIOUS PATCHING AND REPAIR MATERIALS

- A. Manufacturers:
  - 1. Adhesives Technology Corporation: [www.atcepoxy.com/#sle](http://www.atcepoxy.com/#sle).
  - 2. ARDEX Engineered Cements: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
  - 3. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
  - 4. Euclid Chemical Company: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
  - 5. Kaufman Products Inc: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
  - 6. Master Builders Solutions by BASF: [www.master-builders-solutions.basf.us/en-us/#sle](http://www.master-builders-solutions.basf.us/en-us/#sle).
  - 7. The QUIKRETE Companies: [www.quikrete.com/#sle](http://www.quikrete.com/#sle).
  - 8. SpecChem, LLC: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
  - 9. Stauf USA LLC: [www.staufusa.com/#sle](http://www.staufusa.com/#sle).
  - 10. W. R. Meadows, Inc: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- B. Bonding Slurry: Water-based latex admixture complying with ASTM C1059/C1059M, combined with Portland cement and sand in accordance with admixture manufacturer's instructions.
  - 1. Admixture Manufacturers:
    - a. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - b. Euclid Chemical Company; AKKRO-7T: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - c. SpecChem, LLC; Strong Bond - Acrylic Bonder: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - d. W. R. Meadows, Inc; Acry-lok: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- C. Cementitious Resurfacing Mortar: One- or two-component, factory-mixed, polymer-modified cementitious mortar designed for continuous thin-coat application.
  - 1. In-place material resistant to freeze/thaw conditions.
  - 2. Mixed with water or latex type bonding agent in proportions as recommended by manufacturer.
  - 3. Integral corrosion inhibitor.
  - 4. Recommended Thickness: Feather edge to 1/8 inch.
  - 5. Color: Gray.
  - 6. Manufacturers:
    - a. SILPRO Corporation; Raeco Skimwall: [www.silpro.com/#sle](http://www.silpro.com/#sle).
    - b. Master Builders Solutions by BASF; MasterEmaco T 1061DR: [www.master-builders-solutions.basf.us/en-us/#sle](http://www.master-builders-solutions.basf.us/en-us/#sle).
    - c. SpecChem, LLC; Duo Patch: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
- D. Cementitious Repair Mortar, Trowel Grade: One- or two-component, factory-mixed, polymer-modified cementitious mortar.
  - 1. In-place material resistant to freeze/thaw conditions.
  - 2. Mixed with water or latex type bonding agent in proportions as recommended by manufacturer.
  - 3. Dry Material: Complies with ASTM C928/C928M.
  - 4. Integral corrosion inhibitor.
  - 5. Manufacturers:
    - a. Koster American Corporation: [www.kosterusa.com/#sle](http://www.kosterusa.com/#sle).
    - b. Master Builders Solutions by BASF; MasterEmaco T 1060DR: [www.master-builders-solutions.basf.us/en-us/#sle](http://www.master-builders-solutions.basf.us/en-us/#sle).
- E. Cementitious Repair Mortar, Form and Pour/Pump Grade: Flowable, one- or two-component, factory-mixed, polymer-modified cementitious mortar; in-place material resistant to freeze/thaw conditions.



1. Mixed with water in proportions as recommended by manufacturer.
  2. Integral corrosion inhibitor.
  3. Manufacturers:
    - a. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - b. Euclid Chemical Company; EUCOCRETE: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - c. Euclid Chemical Company; EUCOCRETE SUPREME: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - d. Five Star Products, Inc; Five Star Structural Concrete: [www.fivestarprouducts.com/#sle](http://www.fivestarprouducts.com/#sle).
    - e. Kaufman Products Inc; Patchwell Deep: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
    - f. Master Builders Solutions by BASF; MasterEmaco S 440: [www.master-builders-solutions.basf.us/en-us/#sle](http://www.master-builders-solutions.basf.us/en-us/#sle).
    - g. SpecChem, LLC; Duo Patch; [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - h. SpecChem, LLC; RepCon H-350; [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - i. W. R. Meadows, Inc; Meadow-Crete FNP: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- F. Cementitious Pavement Repair Mortar: Fast hardening, flowable; composed of cement, sand, and additives; capable of setting in cold weather conditions without the aid of chloride- or gypsum-based accelerators; in-place material resistant to freeze/thaw conditions.
1. Dry Material: Complies with ASTM C928/C928M.
  2. Integral corrosion inhibitor.
  3. Time To Open To Traffic: 6 hours, maximum.
  4. Time to Top-Coating: 4 hours, maximum.
  5. Manufacturers:
    - a. ARDEX Engineered Cements; ARDEX ERM: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
    - b. ARDEX Engineered Cements; ARDEX CD: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
    - c. ARDEX Engineered Cements; ARDEX Fine CD: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
    - d. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - e. Kaufman Products Inc; Duracrete II: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
    - f. Kaufman Products Inc; Duracrete II FT: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
    - g. SpecChem, LLC; RepCon 928: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - h. SpecChem, LLC; RepCon 928 FS: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
- G. Cementitious Hydraulic Waterstop: Very fast setting, low slump, hand formable, and capable of stopping active water leaks; in-place material resistant to freeze/thaw conditions.
1. Manufacturers:
    - a. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - b. Euclid Chemical Company; SPEED PLUG: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - c. Kaufman Products Inc; SurePlug - regular set: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
    - d. Kaufman Products Inc; HiCap: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
    - e. SpecChem, LLC; SpecPlug or Super SpecPlug; [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - f. United Gilsonite Laboratories; FAST PLUG® Hydraulic Cement: [www.ugl.com/#sle](http://www.ugl.com/#sle).
    - g. W. R. Meadows, Inc; Meadow-Plug or Meadow-Patch 5: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- H. Exterior Self-Leveling Concrete Topping: Portland cement-based; suitable as wear surface topping in exterior and wet locations as well as underlayment for applied materials.
1. Compressive Strength: 4300 pounds per square inch, minimum, at 28 days, when tested in accordance with ASTM C109/C109M, air cured.
  2. Flexural Strength: 1000 pounds per square inch, minimum, at 28 days, when tested in accordance with ASTM C348.
  3. Manufacturers:
    - a. ARDEX Engineered Cements; ARDEX K301: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).

- b. Kaufman Products Inc; SureFlow 042: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
- I. Exterior Self-Leveling Concrete Floor Topping:
  - 1. Minimum Compressive Strength at 28 Days, ASTM C1708/C1708M: 7,000 pounds per square inch.
  - 2. Manufacturers:
    - a. LATICRETE International, Inc; LATICRETE SUPERCAP SC650-MC: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).
    - b. LATICRETE International, Inc; NXT Level SP: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).
- J. Pre-Blended Concrete Mix for Small Projects: Construction-grade Portland cement uniformly blended with aggregates and other approved concrete ingredients, requiring only the addition of water.
  - 1. Compressive Strength: 4000 pounds per square inch, minimum, at 28 days, when tested in accordance with ASTM C39/C39M.

## 2.03 EPOXY PATCHING AND REPAIR MATERIALS

- A. Manufacturers:
  - 1. Adhesives Technology Corporation: [www.atcepoxy.com/#sle](http://www.atcepoxy.com/#sle).
  - 2. Chase Construction Products: [www.chasecorp.com/#sle](http://www.chasecorp.com/#sle).
  - 3. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
  - 4. Euclid Chemical Company: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
  - 5. Kaufman Products Inc.: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
  - 6. SpecChem, LLC: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
  - 7. Sto Corp: [www.stocorp.com/#sle](http://www.stocorp.com/#sle).
  - 8. W. R. Meadows, Inc: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- B. Epoxy Repair Mortar: Epoxy resin mixed with aggregate and other materials in accordance with manufacturer's instructions for purpose intended; comply with pot life and workability limits.
  - 1. Manufacturers:
    - a. ARDEX Engineered Cements; ARDEX BACA: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
    - b. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - c. Euclid Chemical Company; DURALFLEX FASTPATCH: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - d. Kaufman Products Inc; SurePoxy Mortar, SurePoxy HMLV, or SurePoxy HMLV Class B: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
    - e. LATICRETE International; SPARTACOTE™ Epoxy Fill Coat: [www.laticrete.com/#sle](http://www.laticrete.com/#sle).
    - f. Rust-Oleum Corporation; TurboKrete Concrete Patching Compound: [www.rustoleum.com/#sle](http://www.rustoleum.com/#sle).
    - g. SpecChem, LLC; SpecPoxy 1000, SpecPoxy 2000, SpecPoxy 3000 or SpecPoxy 3000 FS: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - h. W. R. Meadows, Inc; Rezi-Weld Gel Paste, Rezi-Weld Gel Paste State, Rezi-Weld 1000, Rezi-Weld LV, or Rezi-Weld LV State: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- C. Epoxy Injection Adhesive:
  - 1. Manufacturers:
    - a. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - b. Euclid Chemical Company; DURAL FAST SET LV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - c. Kaufman Products Inc; SurePoxy HM, SurePoxy HMLV, SurePoxy HMLV Class B, or SurePoxy HMSLV: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
    - d. SpecChem, LLC; SpecPoxy 1000; [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).

- e. W. R. Meadows, Inc; Rezi-Weld LV, Rezi-Weld LV State, Rezi-Weld (IP), or Rezi-Weld Gel Paste: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- D. Epoxy Bonding Adhesive: Non-sag, two-component, 100 percent solids; recommended by manufacturer for purpose and conditions under which used.
- 1. Non-Load-Bearing Applications: ASTM C881/C881M Type I, II, III, IV, or V, whichever is appropriate to application.
  - 2. Load-Bearing Applications: ASTM C881/C881M Type IV or V, whichever is appropriate to application.
  - 3. Other Applications: ASTM C881/C881M Type as appropriate to application.
  - 4. Manufacturers:
    - a. ARDEX Engineered Cements; ARDEX BACA: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
    - b. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - c. Euclid Chemical Company; DURAL FAST SET LV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - d. Euclid Chemical Company; DURALFLEX GEL: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - e. Euclid Chemical Company; DURALFLEX LV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - f. Euclid Chemical Company; DURAL 452 GEL, DURAL 452 LV, or DURAL 452 MV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - g. Kaufman Products Inc; SurePoxy HM Gel: [www.kaufmanproducts.net/#sle](http://www.kaufmanproducts.net/#sle).
    - h. Pecora; Dynapoxy Healer/Sealer: [www.pecora.com/#sle](http://www.pecora.com/#sle).
    - i. Pecora; Dynapoxy Low-Mod Epoxy: [www.pecora.com/#sle](http://www.pecora.com/#sle).
    - j. SpecChem, LLC; SpecPoxy 2000: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - k. SpecChem, LLC; SpecPoxy 3000 FS: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - l. W. R. Meadows, Inc; Rezi-Weld Gel Paste: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - m. W. R. Meadows, Inc; Rezi-Weld Gel Paste State: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
    - n. W. R. Meadows, Inc; Rezi-Weld 1000: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).

## 2.04 URETHANE PATCHING AND REPAIR MATERIALS

- A. Manufacturers:
- 1. Adhesives Technology Corporation: [www.atcepoxy.com/#sle](http://www.atcepoxy.com/#sle).
  - 2. ARDEX Engineered Cements: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
  - 3. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
  - 4. Euclid Chemical Company: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
- B. Polyurea-Modified Repair Gel: Rapid setting, two-component, 100 percent solids; use with or without aggregate to repair cracks and spalls in concrete surfaces.
- 1. Manufacturers:
    - a. Citadel Floor Finishing Systems, a division of Rust-Oleum Corporation; CFFS Fortification Formula: [www.citadelfloors.com/#sle](http://www.citadelfloors.com/#sle).
    - b. Rust-Oleum Corporation; Instapatch Ultra Rapid Curing Concrete Repair: [www.rustoleum.com/#sle](http://www.rustoleum.com/#sle).
- C. Polyurethane Repair Gel: Rapid setting, two-component; use with or without aggregate to repair cracks and spalls in concrete surfaces.
- 1. Manufacturers:
    - a. ARDEX Engineered Cements; ARDEX ArdiFix: [www.ardexamericas.com/#sle](http://www.ardexamericas.com/#sle).
    - b. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - c. Euclid Chemical Company; EUCO QWIKstitch: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - d. Rust-Oleum Corporation; Fast Cure High Strength Concrete Repair: [www.rustoleum.com/#sle](http://www.rustoleum.com/#sle).
- D. Hybrid Urethane Patching Material: Rapid setting, two-component, 100 percent solids; for rapid joint repair and crack filling where no future slab movement is anticipated.

1. Manufacturers:
  - a. Curecrete Distribution, Inc; CreteFill Spall Repair: [www.curecrete.com/#sle](http://www.curecrete.com/#sle).
  - b. Curecrete Distribution, Inc; CreteFill Crack Repair EZ Shave: [www.curecrete.com/#sle](http://www.curecrete.com/#sle).

## 2.05 ACCESSORIES

- A. Anchoring Adhesive: Self-leveling or non-sag as applicable.
  1. Self-Leveling Polyester-Based Products:
    - a. W. R. Meadows, Inc; Poly-Grip: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
  2. Self-Leveling Epoxy Products:
    - a. Euclid Chemical Company; DURAL FAST SET LV: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - b. SpecChem, LLC; SpecPoxy 2000; [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - c. W. R. Meadows, Inc; Rezi-Weld 1000, Rezi-Weld (IP), or Rezi-Weld 3/2: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
  3. Non-Sag Epoxy Products:
    - a. Dayton Superior Corporation: [www.daytonsuperior.com/#sle](http://www.daytonsuperior.com/#sle).
    - b. Euclid Chemical Company; DURAL FAST SET GEL: [www.euclidchemical.com/#sle](http://www.euclidchemical.com/#sle).
    - c. SpecChem, LLC; SpecPoxy 3000 or SpecPoxy 3000 FS: [www.specchemllc.com/#sle](http://www.specchemllc.com/#sle).
    - d. W. R. Meadows, Inc; Rezi-Weld Gel Paste or Rezi-Weld Gel Paste State: [www.wrmeadows.com/#sle](http://www.wrmeadows.com/#sle).
- B. Portland Cement: ASTM C150/C150M, Type I, grey.
- C. Sand: ASTM C33/C33M or ASTM C404; uniformly graded, clean.
- D. Water: Clean and potable.
- E. Reinforcing Steel: Deformed bars, ASTM A996/A996M Grade 40 (280), Type A.
  1. Epoxy coated in accordance with ASTM A775/A775M.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work.
- B. Beginning of installation means acceptance of substrate.

### 3.02 PREPARATION

- A. Prepare concrete surfaces to be repaired according to ICRI 310.2R.

### 3.03 CLEANING EXISTING CONCRETE

- A. Clean concrete surfaces of dirt or other contamination using the gentlest method that is effective.
  1. Try the gentlest method first, then, if not clean enough, use a less gentle method taking care to watch for impending damage.
  2. Clean out cracks and voids using same methods.

- B. The following are acceptable cleaning methods, in order from gentlest to less gentle:
  - 1. Water washing using low-pressure, maximum of 100 psi, and, if necessary, brushes with natural or synthetic bristles.
  - 2. Increasing the water washing pressure to maximum of 400 psi.
  - 3. Adding detergent to washing water; with final water rinse to remove residual detergent.
  - 4. Steam-generated low-pressure hot-water washing.

### 3.04 PAINT AND GRAFFITI REMOVAL

- A. Provide paint and graffiti removal from existing concrete as indicated on drawings.

### 3.05 CONCRETE STRUCTURAL MEMBER REPAIR

- A. See drawings for specific areas to be repaired.
- B. Remove broken and soft concrete at least 1/4 inch deep.
- C. Mechanically cut away damaged portions of reinforcement.
- D. Remove corrosion from steel and clean mechanically.
- E. Blast clean remaining exposed reinforcement surfaces.
- F. Repair by welding new bar reinforcement to existing reinforcement using sleeve splices.
  - 1. Perform welding work in accordance with AWS D1.4/D1.4M.
  - 2. Make welded sleeve splices to achieve strength to exceed strength of new reinforcement.
- G. Follow repair product manufacturer's written installation instructions.
- H. Cover exposed steel reinforcement with epoxy mortar.
- I. Work epoxy mortar into broken surface and build up patch to match original.
- J. Feather edges of repairs flush to sound surface and trowel surface to match surrounding area.

### 3.06 CRACK REPAIR USING EPOXY ADHESIVE INJECTION

- A. Repair exposed cracks as indicated on drawings.
- B. Provide temporary entry ports spaced to accomplish movement of fluids between ports; no deeper than the depth of the crack to be filled or port size diameter no greater than the thickness of the crack. Provide temporary seal at concrete surface to prevent leakage of adhesive.
- C. Inject adhesive into ports under pressure using equipment appropriate for particular application.
- D. Begin injection at lower entry port and continue until adhesive appears in adjacent entry port. Continue from port to port until entire crack is filled.
- E. Remove temporary seal and excess adhesive.
- F. Clean surfaces adjacent to repair and blend finish.

3.07 CONCRETE SURFACE REPAIR USING CEMENTITIOUS MATERIALS

- A. Clean concrete surfaces, cracks, and joints of dirt, laitance, corrosion, and other contamination using method(s) specified above and allow to dry.
- B. Apply coating of bonding agent to entire concrete surface to be repaired.
- C. Fill voids with cementitious mortar flush with surface.
- D. Apply repair mortar by steel trowel to a minimum thickness of 1/4 inch over entire surface, terminating at a vertical change in plane on all sides.
- E. Trowel finish to match adjacent concrete surfaces.

END OF SECTION 03 0100

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## SECTION 031000

### CONCRETE FORMING AND ACCESSORIES

#### PART 1 - GENERAL

##### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### 1.2 SUMMARY

- A. Section Includes:

- 1. Form-facing material for cast-in-place concrete.
- 2. Form liners.
- 3. Shoring, bracing, and anchoring.

- B. Related Requirements:

- 1. Section 321313 "Concrete Paving" for formwork related to concrete pavement and walks.
- 2. Section 321316 "Decorative Concrete Paving" for formwork related to decorative concrete pavement and walks.

##### 1.3 DEFINITIONS

- A. Form-Facing Material: Temporary structure or mold for the support of concrete while the concrete is setting and gaining sufficient strength to be self-supporting.
- B. Formwork: The total system of support of freshly placed concrete, including the mold or sheathing that contacts the concrete, as well as supporting members, hardware, and necessary bracing.

##### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

- 1. Review the following:

- a. Special inspection and testing and inspecting agency procedures for field quality control.
- b. Construction, movement, contraction, and isolation joints
- c. Forms and form-removal limitations.



- d. Anchor rod and anchorage device installation tolerances.

## 1.5 ACTION SUBMITTALS

### A. Product Data: For each of the following:

1. Exposed surface form-facing material.
2. Concealed surface form-facing material.
3. Waterstops.
4. Form-release agent.

### B. Shop Drawings: Prepared by, and signed and sealed by, a qualified professional engineer responsible for their preparation, detailing fabrication, assembly, and support of forms.

1. For exposed vertical concrete walls, indicate dimensions and form tie locations.
2. Indicate dimension and locations of construction and movement joints required to construct the structure in accordance with ACI 301 (ACI 301M).
  - a. Location of construction joints is subject to approval of the Architect.
3. Indicate location of waterstops.
4. Indicate form liner layout and form line termination details.
5. Indicate proposed schedule and sequence of stripping of forms, shoring removal, and reshoring installation and removal.
6. Indicate layout of insulating concrete forms, dimensions, course heights, form types, and details.

### C. Samples:

1. For waterstops.
2. For Form Liners: 12-inch by 12-inch (305-mm by 305-mm) sample, indicating texture.

## 1.6 INFORMATIONAL SUBMITTALS

### A. Qualification Data: For testing and inspection agency.

### B. Research Reports: For insulating concrete forms indicating compliance with International Code Council Acceptance Criteria AC308.

### C. Field quality-control reports.

### D. Minutes of preinstallation conference.

## 1.7 QUALITY ASSURANCE

### A. Testing and Inspection Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Form Liners: Store form liners under cover to protect from sunlight.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Concrete Formwork: Design, engineer, erect, shore, brace, and maintain formwork, shores, and reshores in accordance with ACI 301 (ACI 301M), to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads, so that resulting concrete conforms to the required shapes, lines, and dimensions.
  - 1. Design wood panel forms in accordance with APA's "Concrete Forming Design/Construction Guide."
  - 2. Design formwork to limit deflection of form-facing material to 1/240 of center-to-center spacing of supports.
    - a. For architectural concrete specified in Section 033300 "Architectural Concrete," limit deflection of form-facing material, studs, and walers to 0.0025 times their respective clear spans (L/400).

### 2.2 FORM-FACING MATERIALS

- A. As-Cast Surface Form-Facing Material:
  - 1. Provide continuous, true, and smooth concrete surfaces.
  - 2. Furnish in largest practicable sizes to minimize number of joints.
  - 3. Acceptable Materials: As required to comply with Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete, and as follows:
    - a. Plywood, metal, or other approved panel materials.
    - b. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
      - 1) APA HDO (high-density overlay).
      - 2) APA MDO (medium-density overlay); mill-release agent treated and edge sealed.
      - 3) APA Structural 1 Plyform, B-B or better; mill oiled and edge sealed.
      - 4) APA Plyform Class I, B-B or better; mill oiled and edge sealed.
- B. Concealed Surface Form-Facing Material: Lumber, plywood, metal, plastic, or another approved material.

1. Provide lumber dressed on at least two edges and one side for tight fit.

## 2.3 WATERSTOPS

- A. Flexible PVC Waterstops: U.S. Army Corps of Engineers CRD-C 572, for embedding in concrete to prevent passage of fluids through joints, with factory fabricate corners, intersections, and directional changes.
- B. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).

## 2.4 RELATED MATERIALS

- A. Reglets: Fabricate reglets of not less than 0.022-inch- (0.55-mm-) thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- B. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- D. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- E. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
  1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
  2. Form release agent for form liners shall be acceptable to form liner manufacturer.
- F. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  1. Furnish units that leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
  2. Furnish ties that, when removed, leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
  3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF FORMWORK

- A. Comply with ACI 301 (ACI 301M).
- B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 (ACI 117M) and to comply with the Surface Finish designations specified in Section 033000 "Cast-In-Place Concrete" for as-cast finishes **and Section 033300 "Architectural Concrete"**.
- C. Limit concrete surface irregularities as follows:
  - 1. Surface Finish-1.0: ACI 117 Class D, 1 inch (25 mm).
  - 2. Surface Finish-2.0: ACI 117 Class B, 1/4 inch (6 mm).
  - 3. Surface Finish-3.0: ACI 117 Class A, 1/8 inch (3.0 mm).
- D. Construct forms tight enough to prevent loss of concrete mortar.
  - 1. Minimize joints.
  - 2. Exposed Concrete: Symmetrically align joints in forms.
- E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.
  - 1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
  - 2. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
  - 3. Install keyways, reglets, recesses, and other accessories, for easy removal.
- F. Do not use rust-stained, steel, form-facing material.
- G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
  - 1. Provide and secure units to support screed strips
  - 2. Use strike-off templates or compacting-type screeds.
- H. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible.
  - 1. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar.
  - 2. Locate temporary openings in forms at inconspicuous locations.
- I. **Chamfer** exterior corners and edges of permanently exposed concrete.
- J. At construction joints, overlap forms onto previously placed concrete not less than 12 inches (305 mm).

- K. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.
1. Determine sizes and locations from trades providing such items.
  2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.
- L. Construction and Movement Joints:
1. Construct joints true to line with faces perpendicular to surface plane of concrete.
  2. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
  3. Place joints perpendicular to main reinforcement.
  4. Locate joints for beams, slabs, joists, and girders in the middle third of spans.
    - a. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
  5. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  6. Space vertical joints in walls as indicated on Drawings.
    - a. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
- M. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection.
1. Locate ports and openings in bottom of vertical forms, in inconspicuous location, to allow flushing water to drain.
  2. Close temporary ports and openings with tight-fitting panels, flush with inside face of form, and neatly fitted, so joints will not be apparent in exposed concrete surfaces.
- N. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- O. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- P. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### 3.2 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
4. Install dovetail anchor slots in concrete structures, as indicated on Drawings.
5. Clean embedded items immediately prior to concrete placement.

### 3.3 INSTALLATION OF WATERSTOPS

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm.
1. Install in longest lengths practicable.
  2. Locate waterstops in center of joint unless otherwise indicated on Drawings.
  3. Allow clearance between waterstop and reinforcing steel of not less than 2 times the largest concrete aggregate size specified in Section 033000 "Cast-In-Place Concrete."
  4. Secure waterstops in correct position at 12 inches (305 mm) on center.
  5. Field fabricate joints in accordance with manufacturer's instructions using heat welding.
    - a. Miter corners, intersections, and directional changes in waterstops.
    - b. Align center bulbs.
  6. Clean waterstops immediately prior to placement of concrete.
  7. Support and protect exposed waterstops during progress of the Work.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated on Drawings, according to manufacturer's written instructions, by adhesive bonding, mechanically fastening, and firmly pressing into place.
1. Install in longest lengths practicable.
  2. Locate waterstops in center of joint unless otherwise indicated on Drawings.
  3. Protect exposed waterstops during progress of the Work.

### 3.4 REMOVING AND REUSING FORMS

- A. Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations, and curing and protection operations need to be maintained.
1. Leave formwork for beam soffits, joists, slabs, and other structural elements that support weight of concrete in place until concrete has achieved **at least 70 percent** of its 28-day design compressive strength.
  2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

- B. Clean and repair surfaces of forms to be reused in the Work.
  - 1. Split, frayed, delaminated, or otherwise damaged form-facing material are unacceptable for exposed surfaces.
  - 2. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints.
  - 1. Align and secure joints to avoid offsets.
  - 2. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

### 3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a **special inspector and qualified testing and inspecting agency** to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
  - 1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.
  - 2. Inspect insulating concrete forms for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 031000

SECTION 032000  
CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.
2. Welded-wire reinforcement.

B. Related Requirements:

1. Section 321313 "Concrete Paving" for reinforcing related to concrete pavement and walks.
2. Section 321316 "Decorative Concrete Paving" for reinforcing related to decorative concrete pavement and walks.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review the following:

- a. Special inspection and testing and inspecting agency procedures for field quality control.
- b. Construction contraction and isolation joints.
- c. Steel-reinforcement installation.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of steel reinforcement.
2. Zinc repair material.
3. Bar supports.

B. Shop Drawings: Comply with ACI SP-066:

1. Include placing drawings that detail fabrication, bending, and placement.
2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.



3. For structural thermal break insulated connection system, indicate general configuration, insulation dimensions, tension bars, compression pads, shear bars, and dimensions.
- C. Construction Joint Layout: Indicate proposed construction joints required to build the structure.
1. Location of construction joints is subject to approval of Architect.

#### 1.4 INFORMATIONAL SUBMITTALS

- A. Delegated Design Engineer Qualifications: Include the following:
1. Experience providing delegated design engineering services of the type indicated.
  2. Documentation that delegated design engineer is licensed in the **state** in which Project is located.
- B. Welding certificates.
1. Reinforcement To Be Welded: Welding procedure specification in accordance with AWS D1.4/D1.4M.
- C. Material Certificates: For each of the following, signed by manufacturers:
1. Epoxy-Coated Reinforcement: CRSI's "Epoxy Coating Plant Certification."
  2. Dual-Coated Reinforcement: CRSI's "Epoxy Coating Plant Certification."
- D. Material Test Reports: For the following, from a qualified testing agency:
1. Steel Reinforcement:
    - a. For reinforcement to be welded, mill test analysis for chemical composition and carbon equivalent of the steel in accordance with ASTM A706/A706M.
  2. Mechanical splice couplers.
- E. Field quality-control reports.
- F. Minutes of preinstallation conference.

#### 1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
- B. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.4/D 1.4M.

- C. Mockups: Reinforcing for cast-concrete formed surfaces, to demonstrate tolerances and standard of workmanship.
  - 1. Build panel approximately 100 sq. ft. (9.3 sq. m) for formed surface in the location indicated on Drawings or, if not indicated, as directed by Architect.
  - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage and to avoid damaging coatings on steel reinforcement.
  - 1. Store reinforcement to avoid contact with earth.
  - 2. Do not allow epoxy-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
  - 3. Do not allow dual-coated reinforcement to be stored outdoors for more than 60 days without being stored under an opaque covering.
  - 4. Do not allow stainless steel reinforcement to come into contact with uncoated reinforcement.

## PART 2 - PRODUCTS

### 2.1 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60 (Grade 420), deformed.
- B. Low-Alloy Steel Reinforcing Bars: ASTM A706/A706M, deformed.
- C. Headed-Steel Reinforcing Bars: ASTM A970/A970M.
- D. Steel Bar Mats: ASTM A184/A184M, fabricated from ASTM A615/A615M, Grade 60, deformed bars, assembled with clips.
- E. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.
- F. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.
- G. Galvanized-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from galvanized-steel wire into flat sheets.

### 2.2 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A615/A615M, Grade 60 (Grade 420), plain-steel bars, cut true to length with ends square and free of burrs.

- B. Epoxy-Coated Joint Dowel Bars: ASTM A615/A615M, Grade 60 (Grade 420), plain-steel bars, ASTM A775/A775M epoxy coated.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
  - 1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
    - a. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
    - b. For epoxy-coated reinforcement, use CRSI Class 1A epoxy-coated or other dielectric-polymer-coated wire bar supports.
    - c. For dual-coated reinforcement, use CRSI Class 1A epoxy-coated or other dielectric-polymer-coated wire bar supports.
    - d. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.
    - e. For stainless steel reinforcement, use CRSI Class 1 plastic-protected steel wire, all-plastic bar supports, or CRSI Class 2 stainless steel bar supports.
- D. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch (1.2908 mm) in diameter.
  - 1. Finish: **Plain**.
- E. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A775/A775M.
- F. Zinc Repair Material: ASTM A780/A780M.

## 2.3 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protection of In-Place Conditions:
  - 1. Do not cut or puncture vapor retarder.
  - 2. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

### 3.2 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
  - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
  - 2. Do not tack weld crossing reinforcing bars.
- C. Preserve clearance between bars of not less than 1 inch (25 mm), not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318 (ACI 318M).
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Splices: Lap splices as indicated on Drawings.
  - 1. Bars indicated to be continuous, and all vertical bars to be lapped not less than 36 bar diameters at splices, or 24 inches (610 mm), whichever is greater.
  - 2. Stagger splices in accordance with ACI 318 (ACI 318M).
  - 3. Mechanical Splice Couplers: Install in accordance with manufacturer's instructions.
  - 4. Weld reinforcing bars in accordance with AWS D1.4/D 1.4M, where indicated on Drawings.
- G. Install welded-wire reinforcement in longest practicable lengths.
  - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
    - a. For reinforcement less than W4.0 or D4.0, continuous support spacing to not exceed 12 inches (305 mm).
  - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches (50 mm) for plain wire and 8 inches (200 mm) for deformed wire.
  - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
  - 4. Lace overlaps with wire.

### 3.3 JOINTS

- A. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
  - 1. Place joints perpendicular to main reinforcement.
  - 2. Continue reinforcement across construction joints unless otherwise indicated.
  - 3. Do not continue reinforcement through sides of strip placements of floors and slabs.

- B. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length, to prevent concrete bonding to one side of joint.

#### 3.4 INSTALLATION TOLERANCES

- A. Comply with ACI 117 (ACI 117M).

#### 3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- C. Inspections:
  - 1. Steel-reinforcement placement.
  - 2. Steel-reinforcement welding.
- D. Manufacturer's Inspections: Engage manufacturer of structural thermal break insulated connection system to inspect completed installations prior to placement of concrete, and to provide written report that installation complies with manufacturer's written instructions.

END OF SECTION 032000

SECTION 033000  
CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 031000 "Concrete Forming and Accessories" for form-facing materials, form liners, insulating concrete forms, and waterstops.
2. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
3. Section 033300 "Architectural Concrete" for general building applications of specially finished formed concrete.
4. Section 033543 "Polished Concrete Finishing" for concrete floors scheduled to receive a polished concrete finish.
5. Section 035300 "Concrete Topping" for emery- and iron-aggregate concrete floor toppings.
6. Section 312000 "Earth Moving" for drainage fill under slabs-on-ground.
7. Section 321313 "Concrete Paving" for concrete pavement and walks.
8. Section 321316 "Decorative Concrete Paving" for decorative concrete pavement and walks.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
  - a. Contractor's superintendent.

- b. Independent testing agency responsible for concrete design mixtures.
  - c. Ready-mix concrete manufacturer.
  - d. Concrete Subcontractor.
  - e. Special concrete finish Subcontractor.
2. Review the following:
- a. Special inspection and testing and inspecting agency procedures for field quality control.
  - b. Construction joints, control joints, isolation joints, and joint-filler strips.
  - c. Semirigid joint fillers.
  - d. Vapor-retarder installation.
  - e. Anchor rod and anchorage device installation tolerances.
  - f. Cold and hot weather concreting procedures.
  - g. Concrete finishes and finishing.
  - h. Curing procedures.
  - i. Forms and form-removal limitations.
  - j. Methods for achieving specified floor and slab flatness and levelness.
  - k. Floor and slab flatness and levelness measurements.
  - l. Concrete repair procedures.
  - m. Concrete protection.
  - n. Initial curing and field curing of field test cylinders (ASTM C31/C31M.)
  - o. Protection of field cured field test cylinders.

#### 1.4 ACTION SUBMITTALS

##### A. Product Data: For each of the following.

- 1. Portland cement.
- 2. Aggregates.
- 3. Admixtures:
  - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
- 4. Vapor retarders.
- 5. Floor and slab treatments.
- 6. Liquid floor treatments.
- 7. Curing materials.
  - a. Include documentation from color pigment manufacturer, indicating that proposed methods of curing are recommended by color pigment manufacturer.
- 8. Joint fillers.
- 9. Repair materials.

##### B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.
7. Air content.
8. Nominal maximum aggregate size.
9. Synthetic micro-fiber content.
10. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
11. Include manufacturer's certification that permeability-reducing admixture is compatible with mix design.
12. Include certification that dosage rate for permeability-reducing admixture matches dosage rate used in performance compliance test.
13. Intended placement method.
14. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

C. Shop Drawings:

1. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
  - a. Location of construction joints is subject to approval of the Architect.

D. Concrete Schedule: For each location of each Class of concrete indicated in "Concrete Mixtures" Article, including the following:

1. Concrete Class designation.
2. Location within Project.
3. Exposure Class designation.
4. Formed Surface Finish designation and final finish.
5. Final finish for floors.
6. Curing process.
7. Floor treatment if any.

## 1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For the following:

1. Installer: Include copies of applicable ACI certificates.
2. Ready-mixed concrete manufacturer.
3. Testing agency: Include copies of applicable ACI certificates.

B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.



4. Floor and slab treatments.
5. Bonding agents.
6. Adhesives.
7. Vapor retarders.
8. Semirigid joint filler.
9. Joint-filler strips.
10. Repair materials.

C. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Aggregates.
3. Admixtures:
  - a. Permeability-Reducing Admixture: Include independent test reports, indicating compliance with specified requirements, including dosage rate used in test.

D. Floor surface flatness and levelness measurements report, indicating compliance with specified tolerances.

E. Research Reports:

1. For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.
2. For sheet vapor retarder/termite barrier, showing compliance with ICC AC380.

F. Preconstruction Test Reports: For each mix design.

G. Field quality-control reports.

H. Minutes of preinstallation conference.

## 1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs Project personnel qualified as an ACI-certified Flatwork Technician and Finisher and a supervisor who is a certified ACI Flatwork Concrete Finisher/Technician or an ACI Concrete Flatwork Technician.

1. Post-Installed Concrete Anchors Installers: ACI-certified Adhesive Anchor Installer.

B. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

- C. Laboratory Testing Agency Qualifications: A testing agency qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated and employing an ACI-certified Concrete Quality Control Technical Manager.
  - 1. Personnel performing laboratory tests to be an ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor to be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
- D. Field Quality-Control Testing Agency Qualifications: An independent agency, qualified in accordance with ASTM C1077 and ASTM E329 for testing indicated.
  - 1. Personnel conducting field tests to be qualified as an ACI Concrete Field Testing Technician, Grade 1, in accordance with ACI CPP 610.1 or an equivalent certification program.

## 1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.
  - 1. Include the following information in each test report:
    - a. Admixture dosage rates.
    - b. Slump.
    - c. Air content.
    - d. Seven-day compressive strength.
    - e. 28-day compressive strength.
    - f. Permeability.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with ASTM C94/C94M and ACI 301 (ACI 301M).

## 1.9 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 (ACI 301M) and ACI 306.1 and as follows.
  - 1. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
  - 2. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301 (ACI 301M).
  - 3. Do not use frozen materials or materials containing ice or snow.
  - 4. Do not place concrete in contact with surfaces less than 35 deg F (1.7 deg C), other than reinforcing steel.

5. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 (ACI 301M) and ACI 305.1 (ACI 305.1M), and as follows:
1. Maintain concrete temperature at time of discharge to not exceed 95 deg F (35 deg C).
  2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

#### 1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement sheet vapor retarder/termite barrier material and accessories for sheet vapor retarder/ termite barrier and accessories that do not comply with requirements or that fail to resist penetration by termites within specified warranty period.
1. Warranty Period: 10 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 (ACI 301M) unless modified by requirements in the Contract Documents.

#### 2.2 CONCRETE MATERIALS

A. Source Limitations:

1. Obtain all concrete mixtures from a single ready-mixed concrete manufacturer for entire Project.
2. Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant.
3. Obtain aggregate from single source.
4. Obtain each type of admixture from single source from single manufacturer.

B. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, **Type I/II, gray.**

- C. Normal-Weight Aggregates: ASTM C33/C33M, coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: **1/2 inch (25 mm)** nominal for topping slabs, 3/4" typical elsewhere.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Air-Entraining Admixture: ASTM C260/C260M.

E. Water and Water Used to Make Ice: ASTM C94/C94M, potable.

## 2.3 VAPOR RETARDERS

A. Sheet Vapor Retarder, Class A: ASTM E1745, Class A not less than 10 mils (0.25 mm) thick. Include manufacturer's recommended adhesive or pressure-sensitive tape.

## 2.4 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:

a. Ambient Temperature Below 50 deg F (10 deg C): Black.

b. Ambient Temperature between 50 deg F (10 deg C) and 85 deg F (29 deg C): Any color.

c. Ambient Temperature Above 85 deg F (29 deg C): White.

D. Curing Paper: 8-feet- (2438-mm-) wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

E. Water: Potable or complying with ASTM C1602/C1602M.

## 2.5 RELATED MATERIALS

A. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, in accordance with ASTM D2240.

B. Bonding Agent: ASTM C1059/C1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

## 2.6 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3 mm) and that can be feathered at edges to match adjacent floor elevations.
1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
  2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
  3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm) or coarse sand, as recommended by underlayment manufacturer.
  4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested in accordance with ASTM C109/C109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6 mm) and that can be filled in over a scarified surface to match adjacent floor elevations.
1. Cement Binder: ASTM C150/C150M portland cement or hydraulic or blended hydraulic cement, as defined in ASTM C219.
  2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
  3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by topping manufacturer.
  4. Compressive Strength: Not less than 5000 psi (34.5 MPa) at 28 days when tested in accordance with ASTM C109/C109M.

## 2.7 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301 (ACI 301M).
1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash or Other Pozzolans: 25 percent by mass.
  2. Slag Cement: 50 percent by mass.
  3. Silica Fume: 10 percent by mass.
  4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
  5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use water-reducing, high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, and concrete with a w/cm below 0.50.
4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

## 2.8 CONCRETE MIXTURES

A. Class **A**: Normal-weight concrete used for footings, slabs, grade beams, and tie beams.

1. Exposure Class: ACI 318 (ACI 318M) **F0 for interior concrete, F2 for exterior concrete exposed to freeze thaw.**
2. Minimum Compressive Strength: As indicated on the drawings.
3. Maximum w/cm: As indicated on the drawings.
4. Slump Limit: As indicated on the drawings.
5. Air Content: As indicated on the drawings.

## 2.9 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than five minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Verification of Conditions:

1. Before placing concrete, verify that installation of concrete forms, accessories, and reinforcement, and embedded items is complete and that required inspections have been performed.
2. Do not proceed until unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Provide reasonable auxiliary services to accommodate field testing and inspections, acceptable to testing agency, including the following:
1. Daily access to the Work.
  2. Incidental labor and facilities necessary to facilitate tests and inspections.
  3. Secure space for storage, initial curing, and field curing of test samples, including source of water and continuous electrical power at Project site during site curing period for test samples.
  4. Security and protection for test samples and for testing and inspection equipment at Project site.

### 3.3 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
  2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
  3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

### 3.4 INSTALLATION OF VAPOR RETARDER

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder in accordance with ASTM E1643 and manufacturer's written instructions.
1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.
  2. Seal penetrations in accordance with vapor retarder manufacturer's instructions.
  3. Protect vapor retarder during placement of reinforcement and concrete.

### 3.5 JOINTS

- A. Construct joints true to line, with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Coordinate with floor slab pattern and concrete placement sequence.

1. Install so strength and appearance of concrete are not impaired, at locations indicated on Drawings or as approved by Architect.
  2. Place joints perpendicular to main reinforcement.
    - a. Continue reinforcement across construction joints unless otherwise indicated.
    - b. Do not continue reinforcement through sides of strip placements of floors and slabs.
  3. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
  4. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
  5. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Ground: Form weakened-plane control joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Grooved Joints: Form control joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3.2 mm). Repeat grooving of control joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  2. Sawed Joints: Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random cracks.
- D. Isolation Joints in Slabs-on-Ground: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated on Drawings.
  2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface, where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
  3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints:
1. Install dowel bars and support assemblies at joints where indicated on Drawings.
  2. Lubricate or asphalt coat one-half of dowel bar length to prevent concrete bonding to one side of joint.



### 3.6 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
  - 1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
  - 2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301 (ACI 301M), but not to exceed the amount indicated on the concrete delivery ticket.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
  - 1. If a section cannot be placed continuously, provide construction joints as indicated.
  - 2. Deposit concrete to avoid segregation.
  - 3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301 (ACI 301M).
    - a. Do not use vibrators to transport concrete inside forms.
    - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer.
    - c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

### 3.7 FINISHING FORMED SURFACES

#### A. As-Cast Surface Finishes:

1. ACI 301 (ACI 301M) Surface Finish SF-1.0: As-cast concrete texture imparted by form-facing material.
  - a. Patch voids larger than 1-1/2 inches (38 mm) wide or 1/2 inch (13 mm) deep.
  - b. Remove projections larger than 1 inch (25 mm).
  - c. Tie holes do not require patching.
  - d. Surface Tolerance: ACI 117 (ACI 117M) Class D.
  - e. Apply to concrete surfaces not exposed to public view.

### 3.8 FINISHING FLOORS AND SLABS

- A. Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Trowel Finish:
  1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
  2. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance.
  3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
  4. Do not add water to concrete surface.
  5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
  6. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
- C. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and locations indicated on Drawings.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.
2. Coordinate required final finish with Architect before application.

### 3.9 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

#### A. Filling In:

1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

#### B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

### 3.10 CONCRETE CURING

#### A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 (ACI 301M) and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 (ACI 301M) and ACI 305.1 (ACI 305.1M) for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h (1 kg/sq. m x h), calculated in accordance with ACI 305.1, before and during finishing operations.

#### B. Curing Formed Surfaces: Comply with ACI 308.1 (ACI 308.1M) as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
  - a. Continuous Fogging: Maintain standing water on concrete surface until final setting of concrete.
  - b. Continuous Sprinkling: Maintain concrete surface continuously wet.
  - c. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
  - d. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.

- e. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.
  - 1) Recoat areas subject to heavy rainfall within three hours after initial application.
  - 2) Maintain continuity of coating and repair damage during curing period.

### 3.11 TOLERANCES

- A. Conform to ACI 117 (ACI 117M).

### 3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler in accordance with manufacturer's written instructions.
  - 1. Defer joint filling until concrete has aged at least one month.
  - 2. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints.
- D. Overfill joint, and trim joint filler flush with top of joint after hardening.

### 3.13 CONCRETE SURFACE REPAIRS

- A. Defective Concrete:
  - 1. Repair and patch defective areas when approved by Architect.
  - 2. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
  - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete.

- a. Limit cut depth to 3/4 inch (19 mm).
  - b. Make edges of cuts perpendicular to concrete surface.
  - c. Clean, dampen with water, and brush-coat holes and voids with bonding agent.
  - d. Fill and compact with patching mortar before bonding agent has dried.
  - e. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement, so that, when dry, patching mortar matches surrounding color.
    - a. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching.
    - b. Compact mortar in place and strike off slightly higher than surrounding surface.
  3. Repair defects on concealed formed surfaces that will affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces:
1. Test unformed surfaces, such as floors and slabs, for finish, and verify surface tolerances specified for each surface.
    - a. Correct low and high areas.
    - b. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
  2. Repair finished surfaces containing surface defects, including spalls, popouts, honeycombs, rock pockets, crazing, and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
  3. After concrete has cured at least 14 days, correct high areas by grinding.
  4. Correct localized low areas during, or immediately after, completing surface-finishing operations by cutting out low areas and replacing with patching mortar.
    - a. Finish repaired areas to blend into adjacent concrete.
  5. Correct other low areas scheduled to receive floor coverings with a repair underlayment.
    - a. Prepare, mix, and apply repair underlayment and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
    - b. Feather edges to match adjacent floor elevations.
  6. Correct other low areas scheduled to remain exposed with repair topping.
    - a. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations.

- b. Prepare, mix, and apply repair topping and primer in accordance with manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
- 7. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete.
  - a. Remove defective areas with clean, square cuts, and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around.
  - b. Dampen concrete surfaces in contact with patching concrete and apply bonding agent.
  - c. Mix patching concrete of same materials and mixture as original concrete, except without coarse aggregate.
  - d. Place, compact, and finish to blend with adjacent finished concrete.
  - e. Cure in same manner as adjacent concrete.
- 8. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar.
  - a. Groove top of cracks and cut out holes to sound concrete, and clean off dust, dirt, and loose particles.
  - b. Dampen cleaned concrete surfaces and apply bonding agent.
  - c. Place patching mortar before bonding agent has dried.
  - d. Compact patching mortar and finish to match adjacent concrete.
  - e. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

### 3.14 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.
- B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
  - 1. Testing agency to be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
  - 2. Testing agency to immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.
  - 3. Testing agency to report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.

- a. Test reports to include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:

- 1) Project name.
- 2) Name of testing agency.
- 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
- 4) Name of concrete manufacturer.
- 5) Date and time of inspection, sampling, and field testing.
- 6) Date and time of concrete placement.
- 7) Location in Work of concrete represented by samples.
- 8) Date and time sample was obtained.
- 9) Truck and batch ticket numbers.
- 10) Design compressive strength at 28 days.
- 11) Concrete mixture designation, proportions, and materials.
- 12) Field test results.
- 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
- 14) Type of fracture and compressive break strengths at seven days and 28 days.

- C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.

- D. Inspections:

1. Headed bolts and studs.
2. Verification of use of required design mixture.
3. Concrete placement, including conveying and depositing.
4. Curing procedures and maintenance of curing temperature.
5. Verification of concrete strength before removal of shores and forms from beams and slabs.
6. Batch Plant Inspections: On a random basis, as determined by Architect.

- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M to be performed in accordance with the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
  - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing to be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C143/C143M:

- a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  - b. Perform additional tests when concrete consistency appears to change.
3. Slump Flow: ASTM C1611/C1611M:
- a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
  - b. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete;
- a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
5. Concrete Temperature: ASTM C1064/C1064M:
- a. One test hourly when air temperature is 40 deg F (4.4 deg C) and below or 80 deg F (27 deg C) and above, and one test for each composite sample.
6. Unit Weight: ASTM C567/C567M fresh unit weight of structural lightweight concrete.
- a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
7. Compression Test Specimens: ASTM C31/C31M:
- a. Cast and laboratory cure two sets of **two** 6-inch (150 mm) by 12-inch (300 mm) or 4-inch (100 mm) by 8-inch (200 mm) cylinder specimens for each composite sample.
  - b. Cast, initial cure, and field cure **two** sets of **two** standard cylinder specimens for each composite sample.
8. Compressive-Strength Tests: ASTM C39/C39M.
- a. Test one set of **two** laboratory-cured specimens at seven days and one set of two specimens at 28 days.
  - b. Test one set of **two** field-cured specimens at seven days and one set of two specimens at 28 days.
  - c. A compressive-strength test to be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor to evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa) if specified



compressive strength is 5000 psi (34.5 MPa), or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 5000 psi (34.5 MPa).

11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
12. Additional Tests:
  - a. Testing and inspecting agency to make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.
  - b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.
    - 1) Acceptance criteria for concrete strength to be in accordance with ACI 301 (ACI 301M), Section 1.6.6.3.
13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

### 3.15 PROTECTION

#### A. Protect concrete surfaces as follows:

1. Protect from petroleum stains.
2. Diaper hydraulic equipment used over concrete surfaces.
3. Prohibit vehicles from interior concrete slabs.
4. Prohibit use of pipe-cutting machinery over concrete surfaces.
5. Prohibit placement of steel items on concrete surfaces.
6. Prohibit use of acids or acidic detergents over concrete surfaces.
7. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.
8. Protect concrete surfaces scheduled to receive surface hardener or polished concrete finish using Floor Slab Protective Covering.

END OF SECTION 033000

SECTION 04 0101  
REPAIR AND CLEANING OF EXISTING MASONRY

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 01 sections.
- B. Work of this section shall be governed by the Contract Documents. Provide materials, labor, equipment, and services necessary to furnish, deliver, and install all work of this section as shown on the drawings, as specified herein, and/or as required by job conditions.

1.02 SUMMARY

A. Section Includes:

- 1. Cleaning, repointing and repair of existing masonry.
  - a. Stain and dirt removal by chemicals from historic surfaces including limestone, unpolished granite, terra cotta, concrete and brick. Mock-ups will determine the most appropriate method.
  - b. Visual Requirements to maintain aesthetic or historic qualities of Project by protecting Work designated to remain.
  - c. Including paint removal on exterior brick, granite and limestone masonry as indicated on drawings.
  - d. Cleaning, repointing and repair of exterior limestone masonry, granite and other stone masonry including Terra Cotta, as indicated on the Drawings.
  - e. Cleaning, repointing and repair of the exterior brick masonry walls and other stone, as indicated on the Drawings.
  - f. Terra Cotta repair, restoration and skyward waterproofing for top of cornice as indicated on drawings.
  - g. Replacement of Terra Cotta, stone masonry and brick units as indicated on drawings.
  - h. Repointing for mortar joints in brick, Terra Cotta and stone masonry as indicated on drawings..
  - i. Water cleaning of existing interior and exterior masonry surfaces as indicated on drawings.

B. Related Sections:

- 1. Section 040511 Mortar and Masonry Grout - for items not defined in this section.
- 2. Section 042000 Unit Masonry - for items not defined in this section.
- 3. Section 079200 Joints Sealants - for items not defined in this section.
- 4. Section 099000 Paints and Coatings - for items not defined in this section.

C. Scope of Cleaning Work: The scope of cleaning work of this Section shall include, but is not limited to, the following items:

- 1. General cleaning for 100 percent cleaning of existing interior masonry and concrete floor as indicated on drawings.
- 2. Paint removal as generally indicated on drawings with an allowance for 5% more than drawings show.
- 3. Patching of masonry walls wherever small holes are encountered and as result of cleaning.

4. Cleaning of exterior limestone masonry walls, as designated on the Drawings, using the "water-misting" method.
  5. Cleaning of the exterior brick masonry walls, as designated on the Drawings, using a restoration cleaner.
  6. Cleaning of efflorescence on the exterior brick masonry walls, as designated on the Drawings, using a restoration cleaner.
  7. Cleaning of exterior limestone masonry walls, as designated on the Drawings, using a low pressure water wash.
  8. Cleaning of selected areas of limestone as designated on the Drawings, using a restoration cleaner or poultice.
  9. Cleaning of the granite building base as designated on the Drawings, using a restoration cleaner.
  10. Cleaning of adhesive residue from the granite building base as designated on the Drawings, using a restoration cleaner.
  11. Cleaning of ferrous stains on the granite, limestone, terra cotta and brick as designated on the Drawings, using a restoration cleaner.
  12. Cleaning of copper stained masonry at selected locations as designated on the Drawings, using a restoration poultice.
  13. Terra Cotta Cleaning and select repairs as indicated on drawings.
- D. Scope of Removal includes removing the following from existing masonry as indicated on drawings:
1. Dirt and soil.
  2. Tar, asphalt, and bitumens.
  3. Paint and coatings.
  4. Graffiti and graffiti resistant coatings.
  5. Rust and metallic stains.
  6. Efflorescence and lime.
  7. Carbon encrustation and soot.
  8. Body oils, finger prints, hand prints, foot prints.
  9. All other non-masonry substances, stains, and contamination.
- E. Scope of masonry joint repointing and sealant replacement as follows:
1. Replacement of Terra Cotta, stone masonry and brick units as indicated on drawings.
  2. Repointing for mortar joints in brick, Terra Cotta and stone masonry.
  3. Repointing as scoped on drawings; the following is applicable if less than 100% repointing is required.
    - a. Repointing required for the worse existing mortar joints for amount indicated on drawing and provide an additional allowance of repointing equal to 10% of all brick to remain.
  4. Repair of damaged masonry for amount indicated on drawings and provide an additional allowance of repair of damaged masonry of 30 SF at 10 separate locations.
- F. Scope of masonry repair as follows:
1. 100% re-pointing of granite, terra cotta, and limestone joints, as designated on the Drawings.
  2. 100% re-pointing of brick joints, as designated on the Drawings.
  3. Repairing vertical cracks in brick by sawcutting and sealing vertical control joints as designated on the Drawings.
  4. Repairing cracks in masonry with cementitious injection grout as designated on the Drawings.
  5. Shoring and repointing at special conditions as designated on the Drawings.
  6. Exposing, cleaning, and painting of embedded steel, and replacement of masonry as designated on the Drawings.

7. Dutchman repairs to granite spalls as designated on the Drawings.
8. Mortar patching and pinning at masonry spalls as designated on the Drawings.
9. Replacement of damaged brick as designated on the Drawings.
10. Patching of masonry at removal of abandoned metal elements as designated on the Drawings.
11. Patching, pinning, and re-tooling of sugared limestone as designated on the Drawings.
12. Routing and sealing of spalled cold joint at concrete as designated on the Drawings.
13. Removal and resetting of selected granite step as designated on the Drawings.
14. Rubbing and tooling of delaminated and scaled granite as designated on the Drawings.

G. Additional Repointing Requirements

1. Comply with ASTM E 2260, Standard Guide for Repointing. (Tuckpointing) Historic Masonry.
2. Comply with the following for brick repointing:
  - a. <https://masonryadvisorycouncil.org/wp-content/uploads/2019/05/Repointing-Masonry>
  - b. <https://www.gobrick.com/docs/default-source/read-research-documents/brick-briefs/repointing-brick-masonry>

1.03 REFERENCE STANDARDS

- A. Masonry Restoration shall conform to the Guidelines of the Secretary of the Interior for Historic Preservation. Techniques employed for masonry cleaning, pointing, and repair shall be as outlined in "Preservation Brief No, 1" (November 2000) as published by the National Park Service.
- B. ACI 530.1/ASCE 6/TMS 602 – Specification for Masonry Structures; American Concrete Institute International; 2008. Contractor shall maintain at least one copy of ACI / ASCE 530.1-88 on site.
- C. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2016.

1.04 SUBMITTALS:

- A. Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's specifications and installation instructions for products used including finishing materials and methods.
- C. Submit manufacturer's technical data sheet for product indicated including recommendations for their application and use.
- D. Submit a work plan describing capture, storage, and disposal as required and/or governed by any and all local, state, and/or federal laws, codes, and regulations.
- E. Samples: Provide sample installation of product. Locations per architect's directions.
- F. Product Data: Manufacturer's data including instructions, recommendations, and restrictions.
- G. Shop Drawings: Indicate setting details of stone. Detail shoring.
- H. Product Data: Provide data on each type of product indicated.

- I. Pre-Submittal Conference: Conduct coordination conference with attendance by representatives of Suppliers and Contractors to review proper methods and the procedures for cleaning masonry. No cleaning work shall begin until the Pre-Submittal Conference takes place.
- J. Sequence of Operations: The Contractor shall submit his proposed schedule and sequence of cleaning operations for review by the Professional and the Using Agent prior to beginning work. No cleaning work shall begin until the sequence of operations is approved.
- K. Product literature: The Contractor shall submit manufacturer's product literature for all cleaning products. Product literature shall include specification data, instructions for use and Material Safety Data Sheets.

#### 1.05 SUBMITTALS FOR MASONRY REPAIR

- A. Product Data: The Contractor shall submit product literature for all manufactured mortar and stone patching materials. Literature shall indicate compliance with the referenced material standards and these specifications shall include, where applicable, manufacturer's instructions for application and use. Include test data substantiating that products comply with requirements.
- B. Qualification Data: For sub-contractor firms to demonstrate their capabilities and experience. Include list of completed projects with project names and addresses, names and addresses of architect's and owner's and other information specified.
- C. Description of Methods of Protection: Prior to commencement of cleaning operations, the Contractor shall submit to the Professional in writing a description of methods of protection of the public and of components of the building which are not to be cleaned. Contractor is required to mask windows from water or material infiltration during cleaning and clean-up any water or material which might enter the building. Contractor is required to protect any plaques or signs attached to the building with 2 layers of plastic for the duration of the masonry cleaning and restoration. Contractor is required to protect all light fixtures. Contractor is required to protect all equipment, louvers, etc. during the cleaning process. The method for securing the plastic shall be reviewed with the Professional before installation. Any tape residue that is left on the building or on a sign /plaque after the plastic has been removed shall also be cleaned/removed by the contractor with a method reviewed and approved by the Professional before proceeding with the work.
- D. Samples for verification:
  - 1. Each type of masonry unit to be used for replacing existing units. Include sets of samples as necessary to show the full range of shape, color, and texture to be expected. For brick, provide a range of up to 4 colors for review.
  - 2. Each type, color and texture of pointing mortar in the form of sample mortar strips, 6 inches (150 mm) long by ¼ inch (6mm) wide, set in aluminum or plastic channels. Include with each sample a list of ingredients with proportions of each. Identify sources, both supplier and quarry, of each type of sand and brand names of cementitious materials and pigments if any. Have each set contain a close color range of at least three samples of different mixes of colored sands and cements that produce a mortar that matches the cleaned stone when cured and dry.
    - a. Limestone pointing mortar materials
    - b. Granite base pointing materials
    - c. Granite steps pointing materials
    - d. Brick pointing materials
  - 3. Patching Compound: Submit sets of patching compound Samples in the form of plugs (patches in drilled holes) in sample units of stone representative of the range of stone colors on the building. Have each set contain a close color range of at least three samples of different mixes of patching compound that matches the variations in existing

- stone when cured and dry.
- a. Limestone patching mortar materials
- b. Brick patching mortar materials
- 4. Each type of adhesive.
- 5. Accessories: Each type of anchor, accessory, and miscellaneous support.
- 6. Limestone Dutchman materials.
- 7. Granite Dutchman materials.

#### 1.06 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week prior to commencing of each major part of the work of this section.
  - 1. Require attendance of parties directly affecting work of this section.
  - 2. Major part of the work of this section: Cleaning
    - a. Cleaning
    - b. Masonry repair and select replacement
    - c. Repointing
- B. Review conditions of installation, installation procedures, and coordination with related work.
- C. Review methods and procedures related to stone restoration and cleaning including, but not limited to, the following:
  - 1. Construction Schedule: Verify availability of materials, Restoration Specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Materials, material application, sequencing, tolerances, and required clearances.

#### 1.07 QUALITY ASSURANCE - IN PLACE SAMPLES:

- A. Comply with Section 014516.13 Contractor's Quality Control.

#### 1.08 QUALITY CONTROL

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- B. Restorer: Company specializing in masonry restoration with minimum three years of documented experience.
- C. The Contractor performing the work of this Section shall have a minimum of five years' experience in the cleaning of masonry materials similar to those required for this project and shall have successfully completed at least three projects of similar scope and size within the previous two years.
- D. Chemical-Cleaner Manufacturer Qualifications: A firm regularly engaged in producing masonry cleaners that have been used for similar applications with successful results, and with factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.
- E. Cleaning and Repair Appearance Standard: Cleaned and repaired surfaces are to have a uniform appearance as viewed from 20 feet (6 m) away by The Professional. Perform additional paint and stain removal, general cleaning, and spot cleaning of small areas that are noticeably different, so that surface blends smoothly into surrounding areas.
- F. Consolidant Manufacturer Qualifications: A firm regularly engaged in producing stone consolidants that have been used for similar applications with successful results, and with

factory-trained representatives who are available for consultation and Project-site inspection and assistance at no additional cost.

- G. Source Limitations: Obtain each type of material for stone repair (stone, cement, sand, etc.) from one source with resources to provide materials of consistent quality in appearance and physical properties.
- H. Retain first subparagraph below if high-lime-content mortar is used.
- I. Retain first paragraph below to control overall appearance from a distance.
- J. Cleaning and Repair Appearance Standard: Cleaned and repaired surfaces are to have a uniform appearance as viewed from 20 feet (6 m) away by The Professional. Perform additional paint and stain removal, general cleaning, and spot cleaning of small areas that are noticeably different, so that surface blends smoothly into surrounding areas.

#### 1.09 QUALITY ASSURANCE - TEST PROCEDURES:

- A. Testing: Before production cleaning, test cleaners, cleaner concentrations, and cleaning techniques on small test samples at inconspicuous locations pre-approved by Owner and Architect.
  - 1. Before production cleaning: test cleaners, cleaner concentrations, and cleaning techniques on small test samples at inconspicuous locations pre-approved by Owner and Architect.
    - a. Repeat testing until successful cleaning is achieved, as judged by the Owner and Architect.
  - 2. Before production patching: test patching materials on small test samples at inconspicuous locations pre-approved by owner and Architect.
    - a. Repeat testing until successful repair patch is achieved, as judged by the Owner and Architect.
    - b. Test patch to include painted surface, applied to match surrounding color and sheen.
- B. Written Records: Provide detailed written records for each cleaning test, each cleaning condition, each substrate, and each contamination type.
  - 1. Record cleaner used, cleaner concentration, cleaning techniques, cleaner dwell time on surface, tools used, water temperature, water pressure, water volume, and other relevant information.
  - 2. Record patching material used, including paint color and sheen, and other relevant information.
  - 3. Use the Written Record to reproduce successful cleaning.
- C. Observation: Perform Quality Assurance Testing under direct observation of the Owner and Architect.

#### 1.10 MOCK-UP

- A. Restore and repoint an existing masonry wall area sized 8 feet long by 6 feet high; include in mock-up area instances of mortar, accessories, wall openings, and flashings.
- B. Clean a 10 ft by 10 ft panel of wall to determine extent of cleaning.
- C. Locate where directed.
- D. Mock-up may remain as part of the Work.

#### 1.11 TEST PANELS

- A. The Contractor, at locations designated by the Professional, shall prepare the following test panels for each of the cleaning methods specified for approval prior to commencing cleaning operations.
  - 1. Water Misting – 10 feet by 10 feet panel of limestone wall panel.
  - 2. Low Pressure Washing – 10 feet by 10 feet panel of limestone wall panel.
  - 3. Chemical Cleaning (Brick) – 10 feet by 10 feet panel of brick wall panel.
  - 4. Execution of this test panel shall determine the required dwell time for the remainder of this type of cleaning.
  - 5. Chemical Cleaning (Limestone) – 4'-0" x 4'-0" section
  - 6. Chemical Cleaning (Granite) – 4'-0" x 4'-0" section
  - 7. Rust Removal/Cleaning – 4'-0" x 4'-0" section

#### 1.12 DELIVERY, STORAGE, HANDLING:

- A. Comply with Division 1 General Requirements and manufacturer's instructions and recommendations.
- B. Deliver cleaning chemicals to the site in the manufacturer's original containers with brand name and product identification information readily visible. Handle, store and protect all materials in such a manner as to prevent contamination and spillage thereof.
- C. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.
- D. Store blast medium materials in manufacturer's packaging.

#### 1.13 SITE/PROJECT CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. Do not blast clean or use process creating dust, dirt, when wind is over 10 mph.
- C. Weather Limitations: Proceed with the work only when existing and forecasted weather conditions permit masonry repair and masonry cleaning work to be performed according to manufacturer's written instructions and specified requirements except where the requirements of this section are more restrictive.
- D. The work of this Section shall be executed only when the air and surface temperatures are greater than 50 degrees F and rising or less than 90 degrees F and falling or within the ranges directed by the cleaning product manufacturer, where applicable. Minimum temperature for masonry cleaning shall be expected to remain above 50 degrees F for at least 2 hours after completion of the washing. In no case shall masonry cleaning be performed when freezing weather is expected within the 24 hours after completion.
- E. Comply with the requirements of all relevant Federal, State, and City Legislation related to the transportation, handling, use, and disposal of all cleaning materials as required by the authorities having jurisdiction.
- F. Contractor shall be responsible for controlling water flow from the cleaning and misting operations at the sidewalk level at all areas where there is public access. Daily cleanup of cleaning media and/or chemicals at building entrances and on portions of the sidewalk and



surrounding areas shall be provided.

- G. The Contractor is responsible for protecting existing adjacent materials during the execution of the work. Provide all necessary protection and work procedures to avoid damage to existing material assemblies not a part of the work of this Section. At a minimum, the Contractor shall:
  - 1. The Contractor shall be responsible for the removal of effluent from cleaning operations, waste materials, packaging and other debris associated with the work of this Section in a manner conforming with federal, state and local environmental regulations.
  - 2. Protect passing pedestrians and vehicles from overspray and wind drift during cleaning operations. Erect barricades and install yellow caution tape and signage as required to restrict access to work area.
  - 3. Protect all metal, glass and painted surfaces adjacent to areas to receive chemical cleaning or water repellent using plastic, plywood, sealants or other materials as required to prevent penetration of cleaning chemicals. The Contractor shall be responsible for surface etching and other damage caused to adjacent materials.
  - 4. Protect the bottom course of limestone cladding during the cleaning of the granite base. The Contractor shall be responsible for rectifying any staining or bleaching of the limestone due to over splash from the granite cleaning chemicals.
  - 5. Protect the adjacent limestone cladding during the cleaning of the brick cleaning. The Contractor shall be responsible for rectifying any staining or bleaching of the limestone due to over splash from the brick cleaning chemicals.
- H. The Contractor shall repair all damage to adjacent materials caused by the execution of the Work of this section at no expense to the Department. Damaged materials shall be repaired or replaced by mechanics experienced in the respective type of work, to the satisfaction of the Professional and Department.
- I. Prevent grout or mortar used in repointing and repair work from staining face of surrounding masonry and other surfaces. Remove immediately grout and mortar in contact with exposed masonry and other surfaces. Protect sills, ledges and projections from mortar droppings.

#### 1.14 COORDINATION

- A. Coordinate stone restoration and cleaning with public circulation patterns at Project Site. Some work is near public circulation patterns. Public circulation patterns cannot be closed off entirely, and in places can only be temporarily redirected around small areas of work. Plan and execute the Work accordingly.

#### 1.15 SEQUENCING AND SCHEDULING

- A.
- B. Perform stone repair work in the following sequence:
  - 1. Remove plant growth.
  - 2. Inspect for open mortar joints and repair before cleaning to prevent the intrusion of water and other cleaning materials into the wall.
  - 3. Remove paint and clean rust stains.
  - 4. Clean stone surfaces. Direct run-off away from building surface.
  - 5. Retain first subparagraph below if water repellents are part of Project.
  - 6. Repair stonework, including replacing existing stone with new stone material (Dutchman).
  - 7. Install composite patch material at areas indicated on the documents.
  - 8. Rake out mortar from joints to be repointed.
  - 9. Point mortar and sealant joints.
  - 10. After repairs and repointing have been completed and cured, perform a final cleaning to remove residues from this work.

11. Coordinate the work of this section so repair work proceeds in a normal sequence and work does not interfere with work of other trades.
- C. As scaffolding is removed, patch anchor holes used to attach scaffolding. Patch holes in stone to comply with "Stone Patching" Article. Patch holes in mortar joints to comply with "Repointing Stonework" Article.

## PART 2 - PRODUCTS

### 2.01 MASONRY MATERIALS

- A. Granite stone: Provide natural building stone of variety, color, texture, grain, veining, finish, size, and shape to match existing stone and with physical properties
1. For existing stone that exhibits a range of colors, texture, grain, veining, finishes, sizes, or shapes, provide stone that proportionally matches that range rather than stone that matches an individual color, texture, grain, veining, finish, size, or shape within that range. Stone is to be standard grade free of cracks, seams, or starts which may impair integrity, appearance, or function and complying with the following ASTM performance standards:
    2. Density – 160 pounds per cubic foot, minimum
    3. Compressive Strength – 19,000 psi, minimum
- B. Limestone: Indiana (oolitic) limestone complying with the requirements of ASTM C568, Category II (medium density). Obtain limestone consistent with the color and texture range of the existing material. Stones shall be sound and free from cracks, chips, and other defects which may affect strength or appearance.
- C. Retain subparagraph below only if original quarry is known to have stone that meets appearance and other requirements. Often, original quarries cannot match historic stonework due to natural variations in the geologic deposit. See discussion in the Evaluations in Division 4 Section "Masonry Restoration and Cleaning."
- D. Retain first two paragraphs below for stone having bedding planes, usually sedimentary stone such as limestone and sandstone. Retain option in second paragraph if there are arches. Revise second paragraph if bedding planes are used ornamentally or with fleuri cut.
- E. Quarrying New Stone: Have quarry clearly label the direction of bedding planes when rough stone is quarried, to facilitate cutting stones so that natural bedding planes will be as required in "Cutting New Stone" Paragraph.
- F. Cutting New Stone: Regardless of how existing stone was cut and set, cut each new stone so that, when it is set in final position, natural bedding planes are essentially horizontal.
- G. Brick: Face brick shall be type FBS, Grade SW, in conformance with ASTM C216. New facing brick shall match existing brick in size, color, range, and texture of existing bricks.

### 2.02 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, Type I, non-staining and without air entrapment. Gray and white Portland cement may be combined where required for color matching of exposed mortar.
1. Provide cement containing not more than 0.60 percent total alkali when tested according to ASTM C 114.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Mortar Sand: ASTM C 144 unless otherwise indicated.

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REPAIR AND CLEANING OF EXISTING MASONRY

1. Color: Provide natural sand of color necessary to produce required mortar color.
  2. Retain first subparagraph below if required.
  3. For pointing mortar, provide sand with rounded edges.
  4. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands if necessary to achieve suitable match.
  5. Sand shall be free of silt, loam, soluble salts and organic matter. Sand shall be cleaned (properly washed) to not cause staining or streaking on the building face.
- D. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars. Mortar pigments, if required to match the existing mortar, shall be a standard product manufactured by Solomon Grind-Chem Service, Riverton Lime Co., Medusa, or other approved manufacturer.
- E. Water: Potable, free from injurious amounts of oil, soluble salts, alkali, acids, organic impurities and other deleterious materials.
- F. Admixtures: do not use admixtures of any kind in mortar, unless otherwise indicated and with Professional's approval.
- G. Aggregate for Mortar: ASTM C144 unless otherwise indicated.
1. Color Mortar Aggregate: natural or manufactured sand to produce mortar color indicated to match size, texture and gradation of existing mortar as closely as possible.
- H. Mortar mixes:
1. Mortar mix proportions for repointing granite:
    - a. 1 part by volume white Portland cement.
    - b. 1 part by volume hydrated lime.
    - c. 3 parts sand.
  2. Mortar mix proportions for repointing limestone:
    - a. 1 part by volume white Portland cement.
    - b. 1 part by volume hydrated lime.
    - c. 6 parts sand.
  3. Mortar mix proportions for repointing brick:
    - a. 1 part by volume white Portland cement.
    - b. 1 part by volume hydrated lime.
    - c. 6 parts sand.
  4. Mortars for setting Dutchman:
    - a. Thin-set applications (joints less than 3/8" thick): Pointing mortar specified above, add Laticrete 4237 in accordance with manufacturer's instructions.

## 2.03 CEMENTITIOUS PATCHING MATERIALS AND MIXES

- A. Stone Patching Compound: Factory-mixed cementitious product that is custom manufactured for patching stone. Provide custom colored composite repair patching materials.
1. Products: Subject to compliance with requirements, provide one of the following or equal as approved by the Professional:
    - a. Cathedral Stone Products, Inc.; Jahn Restoration Mortars.
    - b. Conproco Corporation; Mimic and/or Matrix.
    - c. Edison Coatings, Inc.; Custom System 45.
  2. Use formulation that is vapor and water permeable (equal to or more than the stone), exhibits low shrinkage, frost and salt resistant, has lower modulus of elasticity than the stone units being repaired, and develops high bond strength to all types of stone.
  3. Use formulation having working qualities and retardation control to permit forming and sculpturing where necessary.

4. Formulate patching compound in colors, textures, and grain to match stone being patched. Provide five custom colors to enable matching each piece and type of stone.
  5. Follow manufacturer recommended mixing ratios.
- B. Cementitious Crack Filler: An ultrafine super plasticized grout that can be injected into cracks, is suitable for application to wet or dry cracks, exhibits low shrinkage, and develops high bond strength to all types of stone.
1. Products: Subject to compliance with requirements, provide the following or equal as approved by the Professional:
    - a. Cathedral Stone Products, Inc.; Jahn Injection Grout.
    - b. Conproco Corporation; Terra Cotta Finish.
    - c. Edison Coatings, Inc.; Pump-X 53-Series.
- C. Stone-to-Stone Adhesive: Epoxy-resin stone adhesive with a 15-to 45-minute cure at 70 deg F or 1-part cementitious stone adhesive, recommended by adhesive manufacturer for type of stone repair indicated, and matching stone color.
1. Products: Subject to compliance with requirements, provide the following or equal as approved by the Professional:
    - a. Two-Part Polyester or Epoxy-Resin Stone Adhesive:
      - 1) Akemi North America; Akepox
      - 2) Bonstone Materials Corporation; Fast Set 41
      - 3) Edison Coatings, Inc.; Flexi-Weld 520T
    - b. One-Part Cementitious Stone Adhesive:
      - 1) Cathedral Stone Products, Inc.; Jahn Restoration Adhesive.
- D. Stone Consolidation Treatment: Ready-to-use product designed for consolidation of stone that has deteriorated due to weathering and exposure to pollutants. Treatment shall be composed of silicic-ethyl esters, a neutral catalyst, and solvents.
1. Products: Subject to compliance with requirements, provide the following or equal as approved by the Professional:
    - a. Akemi North America; Stone Strengthener K.
    - b. Cohalan Company, Inc.; Keim Silex OH.
    - c. Diedrich Technologies Inc.; D50C.
    - d. HCT pretreatment in first subparagraph below is recommended by manufacturer for extremely deteriorated carbonate stones (marble and limestone). It forms a conversion layer, not film, on carbonate mineral grains, thereby increasing resistance to acid attack.
    - e. PROSOCO; Conservare OH100 Stone Strengthener with HCT pretreatment.

## 2.04 PAINT REMOVERS

- A. Alkaline Paste Paint Remover: Manufacturer's standard alkaline paste formulation for removing paint coatings from masonry.
1. Products: Subject to compliance with requirements, provide one of the following or equal as approved by the Professional:
    - a. ABR Products, Inc.; 800 Brush Grade.
    - b. Diedrich Technologies Inc.; 606 Multi-Layer Paint Remover or 606X Extra Thick Multi-Layer Paint Remover.
    - c. Hydroclean, Hydrochemical Techniques, Inc.; Hydroclean HT-716 Heavy Duty Paint Remover.
    - d. PROSOCO; Sure Klean Heavy-Duty Paint Stripper.
- B. Solvent-Type Paint Remover: Manufacturer's standard water-rinsable, solvent-type gel formulation for removing paint coatings from masonry.

1. Products: Subject to compliance with requirements, provide one of the following or equal as approved by the Professional:
  - a. ABR Products, Inc.; Super Bio Strip Gel.
  - b. Diedrich Technologies Inc.; 505 Special Coatings Stripper.
  - c. Dumond Chemicals, Inc.; Peel Away 2.
  - d. Hydroclean, Hydrochemical Techniques, Inc.; Hydroclean HT-300 Solvent Paint Remover.
  - e. Price Research, Ltd.; Price Strip-All.
  - f. PROSOCO; Sure Klean Fast Acting Stripper.

## 2.05 MIXING PROCEDURES

- A. Pointing Mortar:
  1. Mix mortar in accordance with ASTM C-270
  2. Measure materials by volume or equivalent weight as indicated. Do not measure by shovel.
  3. Mix ingredients in a clean mechanical batch mixer for 3 to 5 minutes.
  4. Mortar shall stand for 20 minutes prior to use to allow for initial shrinkage. Place mortar in final position within two (2) hours of mixing. Do not retemper or use partially hardened mortar.
- B. Patching Mortar
  1. Mix patching mortar in accordance with the manufacturer's instructions. Add liquid to mortar material in a clean bucket and mix with trowel until all the dry material has been moistened. Do not mix more mortar than can be used in a 30 minute period.
  2. Mortar is to be mixed to the proper consistency when a handful of material squeezed into a ball leaves little or no mortar residue on the hand.
  3. All personnel to be involved in limestone patching work must complete certification coursework as required by the manufacturer.

## 2.06 ACCESSORY MATERIALS

- A. Sealant Materials:
  1. Provide manufacturer's standard chemically curing, elastomeric sealant(s) of base polymer and characteristics indicated below that comply with applicable requirements in Division 7 Section "Joint Sealants."
  2. Colors: Provide colors of exposed sealants to match colors of stonework adjoining installed sealant unless otherwise indicated.
- B. Joint-Sealant Backing:
  1. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
  2. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.
- C. Setting Buttons: Resilient plastic buttons, nonstaining to stone, sized to suit joint thicknesses and bed depths of stone units without intruding into required depths of pointing materials.
- D. Masking Tape: Nonstaining, nonabsorbent material, compatible with pointing mortar, joint primers, sealants, and surfaces adjacent to joints; that will easily come off entirely, including adhesive.

- E. Retain first paragraph below if retaining requirement in Part 3 for coating existing anchors within wall.
- F. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating.
  - 1. Use coating requiring no better than SSPC-SP 3, "Power Tool Cleaning" surface preparation according to manufacturer's literature or certified statement.
  - 2. Use coating with a VOC content of 420 g/L (3.5 lb/gal) or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- G. Miscellaneous Products: Select materials and methods of use based on the following, subject to approval of a mockup:
  - 1. Previous effectiveness in performing the work involved.
  - 2. Little possibility of damaging exposed surfaces.
  - 3. Consistency of each application.
  - 4. Uniformity of the resulting overall appearance.
  - 5. Do not use products or tools that could do the following:
    - a. Remove, alter, or in any way harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
    - b. Leave a residue on surfaces

#### 2.07 MANUFACTURERS:

- A. Restoration and Cleaning Chemicals:
  - 1. Prosoco, Inc. [www.prosoco.com/#sle](http://www.prosoco.com/#sle).
  - 2. Aqua Mix
  - 3. Chemique, Inc.
  - 4. Diedrich Technologies, Inc: [www.diedrichtechnologies.com/#sle](http://www.diedrichtechnologies.com/#sle).
  - 5. HMK Stone Care System: [www.hmkstonecare.com/#sle](http://www.hmkstonecare.com/#sle).
  - 6. Paint removal basis of design:
    - a. Prosoco, Inc. product Sure Klean Heavy Duty Paint Stripper Paint, Coating & Graffiti Removers
- B. Patching:
  - 1. Basis of Design: 3M BONDO All Purpose Putty 3M Bondo
  - 2. Evercoat Polyester Glazing Putty, a division of Illinois Tool Works, Inc., Evercoat.
  - 3. Isopon Body Filler, manufactured by U-POL Ltd. U-POL

#### 2.08 MASONRY CLEANING AND PATCHING MATERIALS GENERAL:

- A. Cleaners: Provide cleaners specifically manufactured for each substrate and soiling condition.
  - 1. Cleaning basis of design for quarry tile: "Aqua Mix 1 & 2 Deep Clean", Aqua Mix
  - 2. General cleaning basis of design for glazed block: "Sure Klean Vana Trol" by Prosoco.
  - 3. Rust Remover Basis of Design: Prosoco "Sure Klean Ferrous Stain Remover".
- B. Water: Clean, drinkable, and free of deleterious materials.
  - 1. 180 Degrees F Hot Water: Required for removal of paint, tar, and asphalt.
- C. Brushes: Soft bristle with fiber type recommended by cleaner manufacturer for each cleaner used.
- D. Pressure Cleaning Equipment:
  - 1. Pressure: 1,000 psi.
  - 2. Spray Tip: 15 degree spread.

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3. Water Flow Rate: 4 gallons per minute. [https://www.3m.com/3M/en\\_US/bondo-us/](https://www.3m.com/3M/en_US/bondo-us/)

## 2.09 CLEANING MATERIALS

### A. CSP Cleaners

1. CSP Bio-Cleaner should be used in their undiluted form. No acids, bases, caustics, solvents or other agents should be added. Products should be applied to limestone, sandstone, unpolished granite, terra cotta, concrete, brownstone, brick and other masonry surfaces. Acceptable products are available through Cathedral Stone Products. Tel: 410-782-9150; fax: 410-782-9155.
2. Miscellaneous Equipment
  - a. Natural bristle brush
  - b. Paint roller
  - c. Airless sprayer
  - d. Clean rags
  - e. Latex gloves
  - f. Eye and skin protection
  - g. Garden hose with running water supply
  - h. Pressure washer using 600 to 1200 psi
  - i. Soft bristle scrub brush

- B. Limestone – Water Cleaning: Water shall be potable, non-staining and free of soluble salts, oils, organic matter and other substances deleterious to the surfaces to be cleaned. No detergents or other agents shall be added to cleaning water unless specifically directed by the Professional.

### C. Brick Cleaning – Light Duty Restoration Cleaner:

1. ProSoCo, Inc.: EnviroKlean Saf Restorer
2. Chemique: Artisan – No Pane Restoration Cleaner
3. Cathedral Stone: masonRE G
4. The product shall be used as packaged. Do not dilute or mix with other products.

### D. Cleaning of Efflorescence from Brick – Light Duty Restoration Cleaner:

1. ProSoCo, Inc.: Sure Klean Hard Water Desposit Remover
2. Chemique: Artisan – Efflorescence Remover
3. Other Approved Equal
4. The product shall be used as packaged. Do not dilute or mix with other products.

### E. Limestone, Granite and Concrete Cleaning – Light Duty Restoration Cleaner:

1. ProSoCo, Inc.: EnviroKlean Saf Restorer
2. Chemique: Artisan – Safer L/S Cleaner
3. Cathedral Stone: masonRE B
4. The product shall be used as packaged. Do not dilute or mix with other products.

### F. Iron Stains on Limestone – Ferrous Stain Remover

1. ProSoCo, Inc.: SureKlean Ferrous Stain Remover
2. Chemique: Artisan – Heavy Duty Rust Remover
3. Cathedral Stone: masonRE Rust Remover
4. The product shall be used as packaged, do not mix with other products. Dilute based on manufacturers requirements listed on product data sheet.

### G. Iron Stains on Granite – Ferrous Stain Remover: Cleaner as manufactured by:

1. ProSoCo, Inc.
2. Chemique: Artisan

3. Cathedral Stone: masonRE
4. The product shall be used as packaged, do not mix with other products. Dilute based on manufacturers requirements listed on product data sheet.

H. Copper Stain Cleaning:

1. ProSoCo, Inc.: T515 Copper Stain Remover
2. Other Approved Equal
3. The product shall be used as packaged, do not mix with other products. Dilute based on manufacturers requirements listed on product data sheet.

2.10 TERRA COTTA RESTORATION AND SKYWARD COATING

- A. Terra Cotta restoration of terra cotta cornice and other masonry terra cotta
- B. Basis of design products for Terra Cotta restoration Manufacturer
  1. CONPROCO 17 Production Drive, Dover, NH 03820
  2. 800.258.3500 FAX 603.743.5744 www.conproco.com
  3. <https://conproco.com/product-category/masonry-repair-restoration/terracotta/>
- C. Provide waterproof and breathable coating for 100% of skyward side of terracotta cornice using Elastideck by Conproco or equal approved products by Jahn or Cathedral Stone.
- D. Conproco Products for the following Terra Cotta Repairs and Restoration:
- E. Decorative protective coating for Parapet and as otherwise indicated on drawings:
  1. ELASTIDECK
- F. Repair and reconstruct natural and cast stone, terracotta and brick:
  1. MATRIX
- G. Repair and reconstruct natural and cast stone, terracotta and brick with smooth finish to match:
  1. MATRIX Superfine
- H. Thin, protective repairs to terracotta, limestone and other soft stones and concrete
  1. MATRIX TR
- I. Repair for Colored Glaze finishes for Terra Cotta and other glazed finishes
  1. Terra-Color
- J. Apply over Terra-Color to match surrounding undamaged terracotta
  1. TERRACOTTA Finish

PART 3 - EXECUTION

3.01 GENERAL

- A. EXAMINATION and PREPARATION
  1. Verify that surfaces to be cleaned are ready for work of this section.
  2. Protect surrounding elements from damage due to restoration procedures.
  3. Carefully remove and store removable items located in areas to be restored, including fixtures, fittings, finish hardware, and accessories; reinstall upon completion.
  4. Separate areas to be protected from restoration areas using means adequate to prevent damage.
  5. Mask immediately adjacent surfaces with material that will withstand cleaning and restoration procedures.

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- B. The Contractor shall inspect the areas to be cleaned prior to commencing operations. All open joint, anchor penetrations and other openings shall be temporarily sealed using removable caulk to prevent penetration of water behind the stone cladding.
- C. Based on testing, cleaning is to be done in the following order:
  - 1. Water-Misting Cleaning
  - 2. Low Pressure Washing
  - 3. Light Duty Chemical Cleaning as Documented, up to three (3) applications as required, with cold water, low-pressure rinse after each application
  - 4. Application of Ferrous Stain Removal as Documented

### 3.02 REPOINT EXISTING MASONRY

- A. General: Repoint joints in granite, limestone, and brick as shown on the Drawings.
  - 1. Perform repointing prior to cleaning masonry surfaces.
  - 2. Cut out loose or disintegrated mortar in joints to minimum 1/2 inch depth or until sound mortar is reached.
  - 3. Use power tools only after test cuts determine no damage to masonry units will result.
  - 4. Do not damage masonry units.
  - 5. When cutting is complete, remove dust and loose material by brushing.
  - 6. Premoisten joint and apply mortar. Pack tightly in maximum 1/4 inch layers. Form a smooth, compact concave joint to match existing.
  - 7. Moist cure for 72 hours.
  - 8. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.
  - 9. Remove excess mortar, smears, and droppings as work proceeds and upon completion.
  - 10. Clean surrounding surfaces.
- B. Mortar: Mixing and Installation Procedures:
  - 1. In cold weather for exterior masonry, maintain the temperature of the mortar at time of use to above 50° F, but less than 85° F. Do not heat water.
  - 2. Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure.
  - 3. Mix ingredients in clean mechanical batch mixer 3 to 5 minutes.
  - 4. Let setting mortar sit 20 minutes prior to use to allow for initial shrinkage.
  - 5. Repointing mortar shall be pre-hydrated to reduce shrinkage. Lime and sand shall be mixed with only enough water to produce an unworkable mix that will retain its shape.

### 3.03 MORTAR PATCHING – LIMESTONE CRACKS

- A. All cracks must be filled as noted on the Drawings. Cracks with existing patches which show visible signs of failure shall be removed and replaced. Prepare crack by removing all previous patching material or foreign debris. If crack is less than 1/8 inch wide, open up crack with a dremel tool with rotar top to a minimum width of 1/8 inch wide.
- B. Remove deteriorated material and remove adjacent material that has begun to deteriorate. Carefully remove additional material so patch will not have feathered edges but will have square or slightly undercut edges on areas to be patched and will be at least ¼ inch thick, but not less than recommended by patching compound manufacturer.
- C. Thoroughly wet area to be patched to prevent suction of moisture from the patching material. Apply a slurry coat of mortar to the substrate.

- D. Install injection mortar material in layers to fill the required depth of crack in accordance with the manufacturer's published instructions. Roughen surface of each layer to provide a key for next layer.
  - 1. Trowel, scrape, or carve surface of patch to match texture and surrounding surface plane or contour of the stone. Shape and finish surface before or after curing, as determined by testing, to best match existing stone.
  - 2. Build up ¼ inch above surrounding stone and carve surface to match adjoining stone after patching compound has hardened.
- E. Keep the mortar patches damp for 72 hours using damp burlap, plastic sheeting, or other membrane as required.
- F. Remove and replace patches with hairline cracks or that show separation from stone at edges, and those that do not match adjoining stone in color or texture.

### 3.04 DUTCHMAN PATCHING – LIMESTONE AND GRANITE

- A. Remove damaged stone down to sound material and square up the edges of the area to be patched to form a neat rectangular opening. When patching granite, a core drill may be used to remove damaged material where the spalled area is small.
- B. Where there is an existing corroded anchor, wire brush or otherwise remove corrosion down to sound metal. Coat anchors with zinc based primer and allow to cure prior to installing Dutchman patch.
- C. Cut a piece of stone of a color and texture matching the original surface to fit the dimensions of the prepared area. A stone plug may be used for small granite patches only in lieu of a traditional Dutchman. Check the fit of the Dutchman prior to applying adhesive, making certain the contact surfaces of the repair stone fit tightly to minimize the appearance of the glue line. Where an entire stone is to be replaced, the Dutchman shall be sized to maintain the existing joint width and placement.
- D. Where the required Dutchman exceeds 100 square inches in area, stainless steel anchor pins will be required. The Contractor shall consult the Professional regarding the number and placement of stainless steel anchors.
- E. Apply adhesive carefully to the prepared opening, keeping adhesive away from exposed edges to minimize squeezing of the adhesive out of the joint and onto the stone surface. Insert the Dutchman into the prepared opening.
- F. After adhesive has set, grind or sand any excess Dutchman material down to the level of the adjoining surface. Using a fine abrasive, complete the sanding until the Dutchman is flush with the surrounding stone.
- G. Remove mortar from joints that abut area of stone removal to same depth as stone was removed. Remove loose mortar particles and other debris from surfaces to be bonded and surfaces of adjacent stone units that will receive mortar by cleaning with stiff-fiber brush.
- H. Retain last option in first paragraph below for stone having bedding planes, usually sedimentary stone such as limestone and sandstone, unless this degree of control is considered unnecessary for dutchmen.
- I. Cut and trim partial replacement to accurately fit area where material was removed from backing stone. Fabricate to size required to produce joints between partial replacement and backing stone of no more than 1/16 inch (1.6 mm) in width, and joints between partial replacement and other stones that match existing joints between stones.

- J. Retain one of first two paragraphs below if large partial replacements that can accommodate pinning are required. Second paragraph might be required for noticeably patterned stones close to view, but is more difficult. Revise pin diameter, length, or spacing if required. Consider deleting third option in either paragraph and detailing pin layout on Drawings. If retaining either paragraph, verify that method is appropriate to type of stone used.
- K. Pinning: Before applying adhesive, prepare for mechanical anchorage consisting of 1/4-inch- (6-mm-) diameter, threaded stainless-steel pins set into 1/4-inch- (6-mm-) diameter holes drilled at a 45-degree downward angle through face of partial replacement and into backing stone. Center and space pins between 3 and 5 inches (75 and 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 2 inches (50 mm) into backing stone and 2 inches (50 mm) into partial replacement with end countersunk at least 3/4 inch (19 mm) from exposed face of partial replacement.
- L. Concealed Pinning: Before applying adhesive, prepare for concealed mechanical anchorage consisting of 1/4-inch- (6-mm-) diameter, threaded stainless-steel pins set into 1/4-inch- (6-mm-) diameter holes drilled into backing stone and into, but not through, the partial replacement. Center and space pins between 3 and 5 inches (75 and 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 2 inches (50 mm) into backing stone and 2 inches (50 mm) into partial replacement, but no closer than 3/4 inch (19 mm) from exposed face of partial replacement.
- M. Apply stone-to-stone adhesive to comply with adhesive manufacturer's written instructions. Coat bonding surfaces of backing stone and partial replacement, completely filling all crevices and voids.
- N. Apply partial replacement while adhesive is still tacky and hold securely in place until adhesive has cured. Use shims, clamps, wedges, or other devices as necessary to align face of partial replacement with face of backing stone.
- O. Retain option in paragraph below if retaining "Pinning" Paragraph.
- P. Clean adhesive residue from exposed surfaces and patch chipped areas and exposed drill holes.

### 3.05 GRANITE AND LIMESTONE REPOINTING

- A. Areas of granite and limestone masonry to be pointed are designated M1 on the Drawings. The extent of the work shall be reviewed with the Professional at the site before beginning operations.
- B. Rake designated mortar material out of the joints:
  1. For limestone, use a chisel less than 1/4 inch in width. Do not use power-operated grinders without the Professional's written approval based upon approved quality-assurance program. Prying against the arrises of the building stones shall be avoided. Do not chip, spall, or cut into the edges of the stone with the chisel or the grinder. Clean all mortar from surfaces within the joint so that the new pointing bonds to the building stone rather than the old mortar.
  2. For granite, use a chisel less than 1/4 inch in width or by mechanical grinding using a carborundum blade. For mechanical grinders, cut out center of mortar bed joints with carborundum blade and remove remaining mortar by hand with chisel and resilient mallet. Prying against the arrises of the building stones shall be avoided. Do not chip, spall, or cut into the edges of the stone with the chisel or the grinder. Clean all mortar from surfaces within the joint so that the new pointing bonds to the building stone rather than the old mortar.
  3. Do not spall edges or widen joints.

- C. Notify the Professional of unforeseen detrimental conditions including voids in mortar joints, cracks, loose stone, rotted wood, rusted metal, and other deteriorated items.
- D. If work is found to be unacceptable, all raking will cease without additional cost to the Department until deficiencies in tools, workmanship, or methodology have been corrected to the Professional's satisfaction.
- E. Rake back a minimum of ½ inch to sound mortar. Brush, vacuum, or blow joints clean with compressed air to remove sediment and debris. Do not use water to remove sediment and debris from the mortar joint.
- F. Apply new mortar in ¼ inch thick layers, allowing each layer to reach initial set/thumb-print hardness before applying succeeding layers. Work mortar into the full depth of the joint using a flexible tool.
- G. When final layer of mortar is thumb-print hard, tool joint as required to match the existing profile. Avoid feather-edging of joints. Remove and dispose of excess mortar promptly before it can set or stain masonry.
- H. Keep joints damp for 72 hours after repointing using damp burlap, plastic, or other waterproof membrane. Adjust curing methods to ensure that pointing mortar is damp throughout its depth without eroding surface mortar.
- I. Hairline cracking within the mortar or mortar separation at edge of a joint is unacceptable. Completely remove such mortar and repoint.
- J. The Contractor shall leave the granite and limestone surface clean of mortar, grease, or other spots. Any compounds proposed for cleaning stains shall be approved by the Professional prior to use.
- K. Pointing with Sealant – for use at the meeting of dissimilar materials and at wash joints:
  - 1. After raking out, keep joints dry and free of mortar and debris.
  - 2. Clean and prepare joint surfaces according to Division 7 Section "Joint Sealants." Prime joint surfaces unless sealant manufacturer recommends against priming. Do not allow primer to spill or migrate onto adjoining surfaces.
  - 3. Fill sealant joints with specified joint sealant according to Division 7 Section "Joint Sealants" and the following:
    - a. Install cylindrical sealant backing beneath the sealant except where space is insufficient. There, install bond-breaker tape.
    - b. Install sealant using only proven installation techniques that will ensure that sealant will be deposited in a uniform, continuous ribbon, without gaps or air pockets, and with complete wetting of the joint bond surfaces equally on both sides. Fill joint flush with surrounding stonework and matching the contour of adjoining mortar joints.
    - c. Install sealant as recommended by sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead:
    - d. Fill joints to a depth equal to joint width, but not more than 1/2 inch (13 mm) deep or less than 1/4 inch (6 mm) deep.
    - e. Immediately after first tooling, apply ground-mortar aggregate to sealant, gently pushing aggregate into the surface of sealant. Retool sealant to form smooth, uniform beads, slightly concave. Remove excess sealant and aggregate from surfaces adjacent to joint.
    - f. Do not allow sealant to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces, particularly rough textures. Remove excess and spillage of sealant promptly as the work progresses. Clean adjoining surfaces by the means necessary to eliminate evidence of spillage, without damage to

adjoining surfaces or finishes, as demonstrated in an approved mockup.

4. Cure sealant according to Division 7 Section "Joint Sealants."

- L. Where repointing work precedes cleaning of existing stone, allow mortar to harden at least 30 days before beginning cleaning work.

### 3.06 GRANITE TOOLING

- A. Areas of deteriorated granite to be tooled are designated as M14 on the Drawings. The extent of the work shall be reviewed with the Professional at the site before beginning operations.
- B. Rub all deteriorated granite with granite gneiss block with round edges (or stone material that is softer and more friable than granite). Remove all loose and friable material on the surface of the granite. Rub all rough edges to sound and smooth surface.

### 3.07 BRICK REPOINTING

- A. Areas of brick masonry to be repointed are designates as M1, M5 on the Drawings. The extent of the work shall be reviewed with the Architect at the site before beginning operations.
- B. Rake designated mortar material out of the joints using a chisel less than ¼ inch in width or by mechanical grinding using a carborundum blade. For mechanical grinders, cut out center of mortar bed joints with carborundum blade and remove remaining mortar by hand with chisel and resilient mallet. Prying against the arrises of the brick shall be avoided. Do not chip, spall, or cut into the edges of the brick. Clean all mortar from surfaces within the joint so that the new pointing bonds to the building stone rather than the old mortar.
- C. If work is found to be unacceptable, all raking will cease without additional cost to the Department until deficiencies in tools, workmanship, or methodology have been corrected to the Professional's satisfaction.
- D. Rake back a minimum of ½ inch to sound mortar. Brush, vacuum, or blow joints clean with compressed air to remove sediment and debris. Do not use water to remove sediment and debris from the mortar joint.
- E. Apply new mortar in ¼ inch thick layers, allowing each layer to reach initial set/thumb-print hardness before applying succeeding layers. Work mortar into the full depth of the joint using a flexible tool.
- F. When final layer of mortar is thumb-print hard, tool joint as required to match the existing profile. Avoid feather-edging of joints. Remove and dispose of excess mortar promptly before it can set or stain masonry.
- G. Keep joints damp for 72 hours after repointing using damp burlap, plastic, or other waterproof membrane.
- H. The Contractor shall leave the brick surface clean of mortar, grease, or other spots. Any compounds proposed for cleaning stains shall be approved by the Professional prior to use.
- I. Pointing with Sealant – for use at the meeting of dissimilar materials and at wash joints:
1. After raking out, keep joints dry and free of mortar and debris.
  2. Clean and prepare joint surfaces according to Division 7 Section "Joint Sealants." Prime joint surfaces unless sealant manufacturer recommends against priming. Do not allow primer to spill or migrate onto adjoining surfaces.
  3. Fill sealant joints with specified joint sealant according to Division 7 Section "Joint Sealants" and the following:

- a. Install cylindrical sealant backing beneath the sealant except where space is insufficient. There, install bond-breaker tape.
  - b. Install sealant using only proven installation techniques that will ensure that sealant will be deposited in a uniform, continuous ribbon, without gaps or air pockets, and with complete wetting of the joint bond surfaces equally on both sides. Fill joint flush with surrounding stonework and matching the contour of adjoining mortar joints.
  - c. Install sealant as recommended by sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead:
    - 1) Fill joints to a depth equal to joint width, but not more than 1/2 inch (13 mm) deep or less than 1/4 inch (6 mm) deep.
  - d. Immediately after first tooling, apply ground-mortar aggregate to sealant, gently pushing aggregate into the surface of sealant. Retool sealant to form smooth, uniform beads, slightly concave. Remove excess sealant and aggregate from surfaces adjacent to joint.
  - e. Do not allow sealant to overflow or spill onto adjoining surfaces, or to migrate into the voids of adjoining surfaces, particularly rough textures. Remove excess and spillage of sealant promptly as the work progresses. Clean adjoining surfaces by the means necessary to eliminate evidence of spillage, without damage to adjoining surfaces or finishes, as demonstrated in an approved mockup.
4. Cure sealant according to Division 7 Section "Joint Sealants."
- J. Where repointing work precedes cleaning of existing brick, allow mortar to harden at least 30 days before beginning cleaning work.

### 3.08 BRICK REPAIR

- A. Carefully dismantle selected areas of masonry where designated M7 on the Drawings. Dismantle adjacent assemblies as required for access to the designated masonry, salvaging components for reuse to the greatest extent possible.
- B. Rake or grind mortar from joints to the greatest extent possible before attempted removal of brick. Avoid excessive prying against the arrises of the selected masonry units to avoid spalling and chipping.
- C. Clean old mortar and sealants from masonry units to be reassembled.
- D. Reset bricks to proper position, straight and plumb and true to line and level, with full mortar bed. Ensure that vertical joints are completely filled with mortar. Rake and point as described above except at coping head joints, which shall be pointed with flexible sealant.
- E. Reinstall adjacent materials or patch in kind as required to complete this installation.

### 3.09 SELECTIVE MASONRY REMOVALS

- A. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut at joints wherever possible and as required to accept new masonry openings as indicated.
- B. Salvage masonry units being removed to the greatest extent possible for re-use as Dutchmen at other areas of the building.

### 3.10 PROTECTION

- A. Protect persons, motor vehicles, surrounding surfaces of building being restored, building site, plants, and surrounding buildings from harm resulting from stone restoration work.

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REPAIR AND CLEANING OF EXISTING MASONRY

1. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of restoration and cleaning work.
- B. Prevent mortar from staining face of surrounding stone and other surfaces.
  1. Cover sills, ledges, and projections to protect from mortar droppings.
  2. Keep wall area wet below rebuilding and pointing work to discourage mortar from adhering.
  3. Immediately remove mortar in contact with exposed stone and other surfaces.
  4. Clean mortar splatters from scaffolding at end of each day.

### 3.11 UNUSED ANCHOR REMOVAL

- A. Remove stone anchors, brackets, wood nailers, and other extraneous items no longer in use unless identified as historically significant or indicated to remain.
  1. Remove items carefully to avoid spalling or cracking stone.
  2. Where directed, if an item cannot be removed without damaging surrounding stone, do the following:
    - a. Cut or grind off item approximately 3/4 inch (20 mm) beneath surface and core drill a recess of same depth in surrounding stone as close around item as practical.
    - b. Immediately paint exposed end of item with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended dry film thickness per coat. Keep paint off sides of recess.
  3. Patch the hole where each item was removed unless directed to remove and replace the stone unit.

### 3.12 STONE REMOVAL AND REPLACEMENT

- A. At locations indicated, remove stone that has deteriorated or is damaged beyond repair. Carefully demolish or remove entire units from joint to joint, without damaging surrounding stone, in a manner that permits replacement with full-size units.
- B. Support and protect remaining stonework that surrounds removal area. Maintain flashing, reinforcement, lintels, and adjoining construction in an undamaged condition.
- C. Notify Professional of unforeseen detrimental conditions including voids, cracks, bulges, and loose units in existing stone or unit masonry backup, rotted wood, rusted metal, and other deteriorated items.
- D. Remove in an undamaged condition as many whole stone units as possible.
  1. Remove mortar, loose particles, and soil from stone by cleaning with hand chisels, brushes, and water.
  2. Remove sealants by cutting close to stone with utility knife and cleaning with solvents.
  3. Store stone for reuse. Store off ground, on skids, and protected from weather.
  4. Deliver cleaned stone not required for reuse to the Department unless otherwise indicated.
- E. Clean stone surrounding removal areas by removing mortar, dust, and loose particles in preparation for replacement.
- F. Replace removed damaged stone with other removed stone in good quality, where possible, or with new stone matching existing stone, including size. Do not use broken units unless they can be cut to usable size.

- G. Do not allow face bedding of stone. Before setting, inspect to verify that each stone has been cut so that, when it is set in final position, natural bedding planes are essentially horizontal. Reject and replace stone with vertical bedding planes except as required for arches, lintels, and copings.
- H. Install replacement stone into bonding and coursing pattern of existing stone. If cutting is required, use a motor-driven saw designed to cut stone with clean, sharp, un-chipped edges. Finish edges to blend with appearance of edges of existing stone.
  - 1. Maintain joint width for replacement stone to match existing joints.
  - 2. Use setting buttons or shims to set stone accurately spaced with uniform joints.
- I. Set replacement stone with completely filled bed, head, and collar joints. Butter vertical joints for full width before setting and set units in full bed of mortar unless otherwise indicated. Replace existing anchors with new anchors of size and type indicated.
  - 1. Tool exposed mortar joints in repaired areas to match joints of surrounding existing stonework.
  - 2. Retain subparagraph above or first subparagraph below. Coordinate with mortar mixes in Part 2.
  - 3. Rake out mortar used for laying stone before mortar sets and point new mortar joints in repaired area to comply with requirements for repointing existing stone, and at same time as repointing of surrounding area.
  - 4. When mortar is sufficiently hard to support units, remove shims and other devices interfering with pointing of joints.

### 3.13 PAINTING STEEL UNCOVERED DURING THE WORK

- A. Inspect steel exposed during stone removal. Where The Professional determines that it is structural, or for other reasons cannot be totally removed, prepare and paint it as follows:
  - 1. Remove paint, rust, and other contaminants as applicable to meet paint manufacturer's recommended preparation.
  - 2. Immediately paint exposed steel with two coats of antirust coating, following coating manufacturer's written instructions and without exceeding manufacturer's recommended rate of application (dry film thickness per coat).
- B. If on inspection and rust removal, the cross section of a steel member is found to be reduced from rust by more than 1/16 inch (1.6 mm) notify The Professional before proceeding.

### 3.14 STONE PLUG REPAIR

- A. Remove cylindrical piece of damaged stone by core-drilling perpendicular to stone surface.
- B. Prepare a replacement plug by core-drilling replacement stone. Use a drill sized to produce a core that will fit into hole drilled in damaged stone with only minimum gap necessary for adhesive. Cut and install plug so that, when it is set in final position, natural bedding planes will match the orientation of bedding planes of the backing stone unless otherwise indicated.
- C. Apply stone-to-stone adhesive to comply with adhesive manufacturer's written instructions. Coat bonding surfaces of existing stone and plug, completely filling all crevices and voids.
- D. Apply plug while adhesive is still tacky and hold securely in place until adhesive has cured.
- E. Clean adhesive residue from exposed surfaces.



### 3.15 STONE-FRAGMENT REPAIR

- A. Carefully remove cracked or fallen stone fragment indicated to be repaired. Reuse only stone fragment that is in sound condition.
- B. Remove soil, loose particles, mortar, and other debris or foreign material, from fragment surfaces to be bonded and from parent stone where fragment had broken off, by cleaning with stiff-fiber brush.
- C. Pinning: Before applying adhesive, prepare for mechanical anchorage consisting of 1/4-inch- (6-mm-) diameter, threaded stainless-steel pins set into 1/4-inch- (6-mm-) diameter holes drilled at a 45-degree downward angle through face of fragment and into parent stone. Center and space pins between 3 and 5 inches (75 and 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 2 inches (50 mm) into parent stone and 2 inches (50 mm) into fragment with end countersunk at least 3/4 inch (19 mm) from exposed face of fragment.
- D. Concealed Pinning: Before applying adhesive, prepare for concealed mechanical anchorage consisting of 1/4-inch- (6-mm-) diameter, threaded stainless-steel pins set into 1/4-inch- (6-mm-) diameter holes drilled into parent stone and into, but not through, the fragment. Center and space pins between 3 and 5 inches (75 and 125 mm) apart and at least 2 inches (50 mm) from any edge. Insert pins at least 2 inches (50 mm) into parent stone and 2 inches (50 mm) into fragment, but no closer than 3/4 inch (19 mm) from exposed face of fragment.
- E. Apply stone-to-stone adhesive to comply with adhesive manufacturer's written instructions. Coat bonding surfaces of fragment and parent stone, completely filling all crevices and voids.
- F. Fit stone fragment onto parent stone while adhesive is still tacky and hold fragment securely in place until adhesive has cured. Use shims, clamps, wedges, or other devices as necessary to align face of fragment with face of parent stone.
- G. Clean adhesive residue from exposed surfaces and patch chipped areas and exposed drill holes.

### 3.16 CRACK INJECTION

- A. General: Comply with cementitious crack-filler manufacturer's written instructions.
- B. Drill 1/4-inch- (6-mm-) diameter injection holes as follows:
  - 1. Transverse Cracks Less Than 3/8 inch (9 mm) Wide: Drill holes through center of crack at 12 to 18 inches (300 to 500 mm) o.c.
  - 2. Transverse Cracks More Than 3/8 inch (9 mm) Wide: Drill holes through center of crack at 18 to 36 inches (500 to 900 mm) o.c.
  - 3. Delaminations: Drill holes at approximately 18 inches (500 mm) o.c. both vertically and horizontally.
  - 4. Drill holes 2 inches (50 mm) deep. Where possible drill holes in mortar joints.
- C. Clean out drill holes and cracks with compressed air and water. Remove dirt and organic matter, loose material, sealants, and failed crack repair materials.
- D. Place plastic injection ports in drilled holes and seal face of cracks between injection ports with clay or other non-staining, removable plugging material. Leave openings at upper ends of cracks for air release.

- E. Inject cementitious crack filler through ports sequentially, beginning at one end of area and working to opposite end; where possible, begin at lower end of injection area and work upward. Inject filler until it extrudes from adjacent ports. After port has been injected, plug with clay or other suitable material and begin injecting filler at adjacent port, repeating process until all ports have been injected.
- F. Clean cementitious crack filler from face of stone before it sets by scrubbing with water.
- G. After cementitious crack filler has set, remove injection ports, plugging material, and excess filler. Patch injection holes and surface of cracks as specified in "Stone Patching" Article.

### 3.17 STONE CONSOLIDATION TREATMENT

- A. Apply treatment to clean, dry surfaces according to manufacturer's written instructions. Remove areas of blind exfoliation, delamination, and flaking before applying.
- B. Apply in cycles to small sections of stonework, not more than 100 sq. ft. (9 sq. m) in area. Each cycle shall consist of 3 successive saturating applications, applied at 5- to 15-minute intervals depending on drying conditions.
- C. Apply by low-pressure spray to point of rejection in each application. Apply from bottom of section to top.
- D. Apply 3 cycles, allowing treated surface to dry for 60 to 90 minutes between cycles.
- E. Protect treated surfaces from rain for 48 hours after treatment.
- F. Allow treated surfaces to dry for at least 21 days before repointing, patching, or applying water repellents or sealants.

### 3.18 CLEANING AFTER STONE REPAIR

- A. After mortar has fully hardened, thoroughly clean exposed stone surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water spray applied at low (100 psi) pressure.
  - 1. Do not use metal scrapers or brushes.
  - 2. Do not use acidic or alkaline cleaners.
- B. Coordinate final rinse with completion of masonry repair work.
- C. Remove all protection erected as part of cleaning operations.
- D. Clean all surfaces at grade level and below, including all areaways that may have been affected by the cleaning operation.
- E. Paragraphs below are examples only; revise to suit Project.
- F. Wash adjacent woodwork and other non-stone surfaces. Use detergent and soft brushes or cloths.
- G. Clean mortar and debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- H. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Where necessary, pressure wash pavement surfaces to remove mortar, dust, dirt, and stains.

- I. As the blocking and other related components associated with the scaffolding system are removed from the masonry surface, the exposed surfaces behind the component are to be cleaned with the low-pressure mild abrasive system.

### 3.19 MASONRY CLEANING:

- A. Comply with cleaner manufacturer's instructions and recommendations.
- B. Effectively protect glass and adjacent substrates from cleaning chemicals and cleaning processes.
- C. Wet surfaces to be cleaned before application of cleaning solutions.
- D. Mix cleaner with water as recommended by cleaner manufacturer.
- E. Apply cleaning solution then work cleaner solution into surface by hand with soft brush.
- F. Work cleaner into all cracks, crevices, and details.
- G. Gently agitate the surface and lift contamination.
- H. Allow cleaner to dwell on the surface for time period used for Quality Assurance Testing - Successful Cleaning. Follow the Written Record.
- I. Do not allow cleaner to dry on the surface.
- J. Rinse thoroughly and completely with water volumes, temperatures, and pressures used for Quality Assurance Testing. Follow the Written Record.
- K. Gently agitate the surface with hand brushes while rinsing.
- L. Keep pressure washer spray nozzle, if used, = 8 inches from the surface.
- M. Repeat cleaning until acceptable cleaning is achieved.
- N. Do not damage substrates.
- O. Do not "bleach", streak, or change actual substrate colors.
- P. Protect all work areas and adjacent areas from bleaching, streaking, soiling and staining.
- Q. Do not damage masonry, mortar, or any surface with high pressure water.
- R. Match approved In Place Samples.

### 3.20 GENERAL APPLICATION of CSP BIO-CLEANER

- A. Follow instructions provided by the manufacturer (See Data Sheet).
- B. Clearly mark or identify the time of application and dwell time.
- C. Apply cleaner using a brush, roller, or airless sprayer to the desired thickness. Thicknesses of cleaner on test patches will determine appropriate thickness.
- D. Leave cleaner on substrate only as long as determined acceptable in the mock-ups and approved by the architect.

- E. If the approved dwell time has elapsed and a stain or blemish persists use a soft bristle scrub brush to agitate the area.
- F. Apply a small amount of CSP Bio-Cleaner to the brush then scrub the area again to facilitate in the removal of the stain if necessary.
- G. Follow instructions provided by the manufacturer (See Data Sheet).
- H. Begin at the top of each section and pressure wash the cleaner and residue off the substrate. Use appropriate pressure as determined in the mock-up.
- I. Pressure wash should be performed at a pressure which will not damage the substrate yet provide adequate removal of cleaner and residue.
- J. Be sure all of the cleaner and residue are washed off the substrate.
- K. Exercise caution during cleaning operations to avoid wind drift of materials to adjacent properties, persons, or cars below. Schedule cleaning operations for times or days when risk to pedestrians or vehicles is at a minimum.
- L. Use only methods and materials determined during testing phase and approved by architect. Clean surface to degree accepted by owner's representative. Do not permit cleaning to continue if methods and materials employed results in any permanent damage to surfaces.
- M. Contractor shall reclaim, characterize and dispose of all waste and residue used in conjunction with this project in accordance with applicable laws. Disposal sites shall be approved by the architect.
- N. During the work, remove from the site discarded cleaning and coating materials, rubbish, cans and rags at the end of each workday.
- O. Upon completion of work, remove all protective coverings and coatings, and clean window glass and other spattered surfaces. Remove spattered coatings by proper methods as recommended by manufacturer, using care not to damage adjacent surfaces.

### 3.21 GLAZE PATCHING

- A. Comply with manufacturer's instructions and recommendations.
- B. Always test patching and painted finish in an inconspicuous location prior to proceeding to ensure durability, compatibility and desired appearance.
- C. Locally clean repair area with warm, soapy water or a surface cleaner to remove dirt, oil, dust or contaminants; let dry completely.
- D. Thoroughly mix the two part system of putty and cream hardener in small amounts that can be used in 3-4 minutes.
- E. Spread initial thin layer of mixed putty over repair area using firm pressure to ensure maximum adhesion. Apply additional layers until desired thickness is reached.
- F. For repairs 1/2 inch or deeper, it is recommend to fill repairs making more than one application.
- G. Allow the putty to dry 15 minutes at 77 degress F.
- H. Sand and shape using 80 grit sandpaper; feather the edge using 180 grit until the surface is smooth.

- I. Prime and paint the area per the manufacturer's recommendation.
- J. Clean tools with acetone or lacquer thinner, per manufacturer's instructions.

### 3.22 WATER-MISTING CLEANING

- A. The Contractor shall protect all building components against damage from weight of suspended cleaning apparatus and against scratching or abrasion damage from protruding parts.
- B. Windows and window frames shall be protected using polyethylene and temporary sealants as required during water misting. The Contractor shall maintain at least one employee on the interior of the building to monitor window and wall conditions during cleaning. Water spray shall cease immediately if leakage is discovered inside the building and shall not resume until the cause is identified and corrected.
- C. Water shall be supplied through nebulizing nozzles to produce a fine mist. The quantity of water delivered to each spray head shall not exceed 15 gallons per hour. The spacing of the spray heads shall be 12" on centers minimum.
- D. Washing shall occur at intervals of one hour on and two hours off during daylight hours. No washing shall be permitted at night.

### 3.23 LOW PRESSURE WASHING

- A. Pressure washing of designated areas shall proceed from the bottom of the area to the top.
- B. Using a nozzle pressure of 800 psi or less (based on the results of the test panel) and a fan tipped spray nozzle, the water spray shall be directed at the stone surface from a distance of not less than 12 inches.

### 3.24 CHEMICAL CLEANING (BRICK, LIMESTONE, and GRANITE)

- A. Chemical cleaning of designated areas shall proceed from the bottom of the area to the top. Wet surfaces to be cleaned thoroughly prior to application of cleaning chemicals to prevent excessive absorption into the stone.
- B. Apply specified cleaning product in accordance with the manufacturer's printed instructions. Do not exceed recommended solution concentrations or dwell times. Cleaning solutions shall be applied by hand using a fiber brush or sponge. Cleaning solutions may not be applied using pressure washing equipment.
- C. Allow cleaner to dwell on the stone in accordance with the manufacturer's printed instructions. Reapply and scrub stubborn stains.
- D. Rinse all cleaned areas thoroughly to remove all traces of cleaner from cracks and corners. Rinse down adjacent materials to prevent discoloration or streaking from cleaning chemicals.

### 3.25 FERROUS STAIN REMOVAL

- A. In a plastic bucket or container, combine poultice ingredients in accordance with manufacturer's printed instructions. Stir continuously until the mixture forms a smooth, wet paste.
- B. Apply a layer of poultice paste, 1/8" to 1/4" in thickness, immediately to the stained surface. Surfaces to be cleaned should be dry and free of surface dirt and dust.

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REPAIR AND CLEANING OF EXISTING MASONRY

- C. Cover with plastic. Leave poultice paste on the masonry for 24 hours or until completely dry.
- D. Once the poultice is completed dried, scrape mixture from the surface using wood, plastic or rubber spatulas. Rinse the treated area thoroughly with water and a soft brush to remove remaining residue.

### 3.26 COPPER STAIN REMOVAL

- A. In a plastic bucket or container, combine poultice ingredients in accordance with manufacturer's printed instructions. Stir continuously until the mixture forms a smooth, wet paste.
- B. Apply a layer of poultice paste, 1/8" to 1/4" in thickness, immediately to the stained surface. Surfaces to be cleaned should be dry and free of surface dirt and dust.
- C. Cover with plastic. Leave poultice paste on the masonry for 24 hours or until completely dry.
- D. Once the poultice is completed dried, scrape mixture from the surface using wood, plastic or rubber spatulas. Rinse the treated area thoroughly with water and a soft brush to remove remaining residue.

### 3.27 CLEAN-UP AND SITE RESTORATION

- A. Excess materials shall be removed from the site. Do not dump excavation around building or on site.
- B. Remove Temporary sealants around window and door openings.
- C. Remove splatters from building immediately.

### 3.28 TERRA COTTA REPAIR AND PATCHING

- A. Strictly follow manufacturer guidelines for the following but not limited to.
- B. Surface Preparation, Mixing, Application, Curing, and Clean up.

END OF SECTION 04 0101

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SECTION 04 0511  
MASONRY MORTARING AND GROUTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Mortar for masonry.
- B. Grout for masonry.

1.02 RELATED REQUIREMENTS

- A. Section 04 0101 - Repair and Cleaning of Existing Masonry: in general.
- B. Section 04 2000 - Unit Masonry: Installation of mortar and grout.

1.03 REFERENCE STANDARDS

- A. ASTM C91/C91M - Standard Specification for Masonry Cement 2023.
- B. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2022a.
- C. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2019a, with Editorial Revision.
- D. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar 2017.
- E. ASTM C476 - Standard Specification for Grout for Masonry 2023.
- F. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry 2020.
- G. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2016.
- H. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2022.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.
- C. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.



1.05 QUALITY ASSURANCE

1.06 PRECONSTRUCTION TESTING

- A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 4000 - Quality Requirements.
- B. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
  - 1. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.08 FIELD CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

- A. Use only factory premixed packaged dry materials for mortar and grout, with addition of water only at project site.
  - 1. Exception: If a specified mix design is not available in a premixed dry package, provide equivalent mix design using standard non-premixed materials.
- B. Mortar Color: As noted.
- C. Mortar Mix Designs: ASTM C270, Property Specification.
  - 1. Historic Exterior Masonry Pointing Mortar: Type O; color to match existing.
  - 2. Masonry below grade and in contact with earth: Type S.
  - 3. Exterior, Loadbearing Masonry: Type N.
  - 4. Exterior, Non-loadbearing Masonry: Type N.
  - 5. Exterior Repointing Mortar: Type N.
  - 6. Interior, Loadbearing Masonry: Type N.
  - 7. Interior, Non-loadbearing Masonry: Type O.
  - 8. Pointing Mortar for Prefaced or Specially Faced Unit Masonry: One part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate equal to 2 percent of Portland cement by weight.
- D. Grout Mix Designs:
  - 1. Grout ASTM C476, 2000 psi.
  - 2. Engineered Masonry: 3,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.
    - a. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
    - b. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

## 2.02 BRICK MASONRY REPOINTING

- A. This project is subject to Historical Commission review and approval, brick repointing mortar mix must be approved by Historical Commission – it must match the original in color, composition and detailing. Because the original bricks used to construct the facade are softer than contemporary bricks, a compatible mortar must be used to allow for the same rate of thermal expansion in the mortar and the bricks. A hard cement mortar may cause cracking and spalling and eventual deterioration of the brickwork. The composition of the mortar must not contain, under any circumstances, more than 20% portland cement. An acceptable ratio is between six-nine parts sand, to two parts lime to one part portland cement. As the color of the aggregate gives much of the characteristic of the mortar, match the new sand with the color and size of the old. Laboratory analysis of the existing mortar is required for submittal for review with the proposed new mortar mix. At areas indicated on elevations, remove deteriorated brick and replace with salvaged matching brick in good condition. Contractor must arrange site visit with representative of Historical Commission to approve field sample of replacement area of existing brick wall using matching salvaged bricks, mortar, and mortar joints. Field sample must be approved before work can begin.

## 2.03 MATERIALS

- A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
1. Type: Type N.
  2. Color: Mineral pigments added as required to produce approved color sample:
  3. Basis of Design Manufacturer:
    - a. Cathedral Stone Products, Inc., <https://www.cathedralstone.com/>
- B. Packaged Dry Material for Mortar for Repointing: Premixed Portland cement, graded sand, and chemical admixtures complying with ASTM C91/C91M with the addition of water only.
1. Color: To match adjacent mortar color.
  2. Basis of Design Manufacturer:
    - a. Cathedral Stone Products, Inc. <https://www.cathedralstone.com/>.
- C. Packaged Dry Material for Mortar for Repointing: Premixed Portland cement, hydrated lime, and graded sand; capable of producing Type O mortar in accordance with ASTM C270 with the addition of water only.
1. Color: Mineral pigments added as required to produce approved color sample.
  2. Manufacturers:
    - a. Cathedral Stone Products, Inc.; <https://www.cathedralstone.com/>
    - b. Limeworks; <https://www.limeworks.us/>
- D. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.
1. Type: Fine.
- E. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
1. Color(s): as indicated on drawings or as selected.
    - a. Brownstone: match purple stone.
    - b. Sandstone: match tan stone.
    - c. Serpentine: match existing red mortar.
    - d. Green precast stone: match existing red mortar.

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MASONRY MORTARING AND GROUTING

- e. Wissahicken Schist: match existing gray.
- 2. Manufacturers:
  - a. Davis Colors: [www.daviscolors.com/#sle](http://www.daviscolors.com/#sle).
  - b. Lambert Corporation: [www.lambertusa.com/#sle](http://www.lambertusa.com/#sle).
  - c. Solomon Colors; Solomon Colors Concentrated A, H, and X Series: [www.solomoncolors.com/#sle](http://www.solomoncolors.com/#sle).

F. Water: Clean and potable.

#### 2.04 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Do not use anti-freeze compounds to lower the freezing point of mortar.
- D. If water is lost by evaporation, re-temper only within two hours of mixing.

#### 2.05 GROUT MIXING

- A. Mix grout in accordance with ASTM C94/C94M.
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.

### PART 3 EXECUTION

#### 3.01 INSTALLATION

- A. Install mortar to requirements of section(s) in which masonry is specified.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not displace reinforcement while placing grout.
- D. Remove excess mortar from grout spaces.

#### 3.02 FIELD QUALITY CONTROL

- A. Test and evaluate mortar in accordance with ASTM C780 procedures.

END OF SECTION 04 0511

## SECTION 04 2000 UNIT MASONRY

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. New 2 hour fire rated elevator shaft enclosure with a clear hoistway of the dimensions shown on drawings and plumb to within 1".
  - 1. Provide solid filled and steel reinforced CMU unit in location required for elevator rail attachments.
- B. Existing masonry replacement units and where indicated on drawings select existing masonry wall extensions for the following:
- C. New brick and CMU infill in existing masonry openings as indicated on drawings.
- D. Concrete block. ASTM C90, normal weight, Type I, concrete masonry units.
- E. Clay Facing Brick.
  - 1. For select repairs / patching to existing as shown on drawings.
  - 2. Entry steps use Basis of Design Glen-Gery thin brick to match / as selected from full range by architect -defer to drawings.
  - 3. [https://www.glengery.com/brick-catalog?types\[24\]=24&tid\[858\]=858&style\[10\]=10&style\[16\]=16&sort\\_by=title](https://www.glengery.com/brick-catalog?types[24]=24&tid[858]=858&style[10]=10&style[16]=16&sort_by=title)
- F. Common Brick.
  - 1. For select repairs / patching to existing as shown on drawings.
- G. Mortar and grout.
  - 1. Mortar ASTM C270.
  - 2. Grout ASTM C476, 2000 psi.
- H. Reinforcement and anchorage.
  - 1. Reinforcing shall be galvanized, epoxy coated, or stainless steel (ASTM A615, Grade 60); submit for approval.
- I. Flashings.
  - 1. Flexible stainless steel flashing with bituminous layer toward lintel to prevent galvanic reaction between galvanized steel lintel and stainless steel flashing.
- J. Lintels.
  - 1. Galvanized Steel.
- K. Accessories.
  - 1. Other items indicated on drawings, listed in this section and as required to have complete system.

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications: Loose steel lintels.
- B. Section 06 1000 - Rough Carpentry: Nailing strips built into masonry.

- C. Section 07 8400 - Firestopping: Firestopping at penetrations of fire-rated masonry and at top of fire-rated walls.
- D. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- B. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip 2022a.
- C. ASTM A580/A580M - Standard Specification for Stainless Steel Wire 2018.
- D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2022.
- E. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire 2019.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.
- G. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.
- H. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement 2022.
- I. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2022.
- J. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile 2021.
- K. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units 2022.
- L. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units 2022.
- M. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar 2018.
- N. ASTM C150/C150M - Standard Specification for Portland Cement 2022.
- O. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes 2018.
- P. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale) 2022.
- Q. ASTM C270 - Standard Specification for Mortar for Unit Masonry 2019a, with Editorial Revision.
- R. ASTM C404 - Standard Specification for Aggregates for Masonry Grout 2018.
- S. ASTM C476 - Standard Specification for Grout for Masonry 2023.
- T. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry 2020.

- U. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete 2016.
  - V. ASTM C1072 - Standard Test Methods for Measurement of Masonry Flexural Bond Strength 2022.
  - W. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar 1992a (Reapproved 2014).
  - X. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover 2008a (Reapproved 2019).
  - Y. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry 2020.
  - Z. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2022.
  - AA. UL (FRD) - Fire Resistance Directory Current Edition.
- 1.04 REFERENCE STANDARDS FOR SELECT MASONRY REPAIR / PATCHING
- A. Masonry patching shall conform to typical masonry industry standards and the following:
  - B. ACI 530.1/ASCE 6/TMS 602 – Specification for Masonry Structures; American Concrete Institute International; 2008. Contractor shall maintain at least one copy of ACI / ASCE 530.1-88 on site.
  - C. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures 2016.
- 1.05 ADMINISTRATIVE REQUIREMENTS
- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.
- 1.06 SUBMITTALS
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
    - 1. Confirmation masonry ties meet BIA standards for wide cavity exceeding 4", 5 3/8" and 6 3/8".
  - C. Shop drawings of 2 hour fire rated elevator CMU shaft enclosure with a clear hoistway of the dimensions as approved by elevator manufacturer/installer and showing location of solid filled and steel reinforced CMU unit in location required for elevator rail attachments for approval of approved by elevator manufacturer/installer.
  - D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.
  - E. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

## 1.07 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.

## 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
- B. Handle and store pre-faced concrete block units in protective cartons or trays. Do not remove from protective packaging until ready for installation.

## PART 2 PRODUCTS

### 2.01 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
  - 1. ASTM C90, normal weight, Type I, concrete masonry units.
  - 2. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depth of 8 inches.
  - 3. Special Shapes: Provide non-standard blocks configured for corners.
    - a. Provide bullnose units for outside exposed corners.
  - 4. Load-Bearing Units: ASTM C90, normal weight.
    - a. Hollow block, as indicated.
    - b. Exposed Faces: Manufacturer's standard color and texture where indicated.
  - 5. Manufacturers:
    - a. The Concrete Products Group; Spec-Brik: [www.concreteproductsgroup.com/#sle](http://www.concreteproductsgroup.com/#sle).
  - 6. Non-Loadbearing Units: ASTM C129.
    - a. Hollow block, as indicated.
    - b. Normal weight.

### 2.02 BRICK UNITS

- A. Manufacturers:
  - 1. Basis of Design products to match existing from: Diener Brick Company 856-858-2000
  - 2. Belden Brick; Belcrest: [www.beldenbrick.com/#sle](http://www.beldenbrick.com/#sle).
  - 3. Endicott Clay Products Co: [www.endicott.com/#sle](http://www.endicott.com/#sle).
  - 4. General Shale Brick: [www.generalshale.com/#sle](http://www.generalshale.com/#sle).
  - 5. Meridian Brick LLC; Athens Architectural Series: [www.meridianbrick.com/#sle](http://www.meridianbrick.com/#sle).
- B. Facing Brick: ASTM C216, Type FBS Smooth, Grade SW.
  - 1. Nominal size: As indicated on drawings.
  - 2. Special shapes: Molded units as required by conditions indicated, unless standard units can be sawn to produce equivalent effect.
  - 3. Compressive strength: As indicated on drawings, measured in accordance with ASTM C67/C67M.

## 2.03 MORTAR AND GROUT MATERIALS

- A. Mortar and Grout: As specified in Section 04 0511.
- B. Mortar ASTM C270.
- C. Grout ASTM C476, 2000 psi.
- D. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.
  - 1. Not more than 0.60 percent alkali.
- E. Hydrated Lime: ASTM C207, Type S.
- F. Mortar Aggregate: ASTM C144.
- G. Grout Aggregate: ASTM C404.
- H. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
  - 1. Color(s): As selected by Architect to match existing from manufacturer's full range.
- I. Water: Clean and potable.
- J. Accelerating Admixture: Nonchloride type for use in cold weather.
- K. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.
- L. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.

## 2.04 REINFORCEMENT AND ANCHORAGE

- A. Manufacturers:
  - 1. Hohmann & Barnard, Inc; X-Seal Anchor: [www.h-b.com/#sle](http://www.h-b.com/#sle).
- B. Reinforcing shall be with approval galvanized, epoxy coated, or stainless steel (ASTM A615, Grade 60).
- C. The more stringent of the following:
- D. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi), deformed billet bars; galvanized.
- E. Reinforcing Steel: ASTM A615, 60 ksi yield grade, deformed billet bars, galvanized finish.
- F. Single Wythe Joint Reinforcement: ASTM A951/A951M.
  - 1. Type: Truss or ladder.
  - 2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M Class 3.
  - 3. Size: 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not less than 5/8 inch of mortar coverage on each exposure.
- G. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 5/8 inch of mortar coverage from masonry face.



- H. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
  - 1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
  - 2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick. min or as required by the following:
    - a. See requirements for cavity width per BIA and ASTM A951/ A951M.
  - 3. Vertical adjustment: Not less than 3-1/2 inches at anchor plates, 1" at pintels.

#### 2.05 ACCESSORIES

- A. Provide all required as needed for complete installation of work shown on drawings.
- B. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

#### 2.06 LINTELS

- A. Galvanized Steel Lintels: as indicated and where applicable see structural drawings and provide installation details as required by BIA.

#### 2.07 MORTAR AND GROUT MIXING

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
  - 1. Masonry below grade and in contact with earth: Type S.
  - 2. Exterior, loadbearing masonry: Type N.
  - 3. Exterior, non-loadbearing masonry: Type N.
  - 4. Interior, loadbearing masonry: Type N.
  - 5. Interior, non-loadbearing masonry: Type O.
- B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.
- C. New Mortar for Old Brick: Proportion by volume only; no more than 20 percent of the total volume of Portland cement and lime combined to be Portland cement.
- D. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
- E. Mixing: Use mechanical batch mixer and comply with referenced standards.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

### 3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

### 3.03 COLD AND HOT WEATHER REQUIREMENTS

- A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

### 3.04 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
  - 1. Bond: Running.
  - 2. Coursing: One unit and one mortar joint to equal 8 inches.
  - 3. Mortar Joints: Concave.

### 3.05 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

### 3.06 LINTELS

- A. Install loose steel lintels over openings.

### 3.07 GROUTED COMPONENTS

- A. Reinforce bond beams with 2, bars, 1 inch from bottom web.
- B. Reinforce columns with , bars, placed .
- C. Lap splices minimum 24 bar diameters.
- D. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- E. Place and consolidate grout fill without displacing reinforcing.
- F. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

### 3.08 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames and glazed frames and other items to be built into the work and furnished under other sections.

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UNIT MASONRY

- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
  - 1. Fill adjacent masonry cores with grout minimum 12 inches from framed and unframed openings; see details.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

### 3.09 TOLERANCES

- A. Install masonry within the site tolerances found in TMS 402/602.

### 3.10 CUTTING AND FITTING

- A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.
- C. Cutting and fitting of units are required under window sills, at sloping cap units for gym access ramp and other locations as indicated.

### 3.11 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

### 3.12 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

### 3.13 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

### 3.14 SCHEDULES

- A. Interior Partitions: Single wythe concrete block units.

END OF SECTION 04 2000

## SECTION 051200

### STRUCTURAL STEEL FRAMING

#### 1.1 SUMMARY

A. Section Includes:

1. Structural steel.
2. Shrinkage-resistant grout.

B. Related Requirements:

1. Section 051213 "Architecturally Exposed Structural Steel Framing" for additional requirements for architecturally exposed structural steel.
2. Section 055000 "Metal Fabrications" for miscellaneous steel fabrications and other steel items not defined as structural steel.

#### 1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

B. Protected Zone: Structural members or portions of structural members indicated as "protected zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.

C. Demand-Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the seismic-load-resisting system and which are indicated as "demand critical" or "seismic critical" on Drawings.

#### 1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

#### 1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site .

## 1.5 ACTION SUBMITTALS

### A. Product Data:

1. Structural-steel materials.
2. High-strength, bolt-nut-washer assemblies.
3. Anchor rods.
4. Threaded rods.
5. Galvanized-steel primer.
6. Galvanized repair paint.
7. Shrinkage-resistant grout.

### B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment Drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.

### C. Delegated Design Submittal: For structural-steel connections indicated on Drawings to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

## 1.6 INFORMATIONAL SUBMITTALS

### A. Welding certificates.

### B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

### C. Mill test reports for structural-steel materials, including chemical and physical properties.

### D. Product Test Reports: For the following:

1. Bolts, nuts, and washers, including mechanical properties and chemical analysis.

### E. Survey of existing conditions.

### F. Source quality-control reports.

### G. Field quality-control reports.

## 1.7 QUALITY ASSURANCE

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).
- B. Shop-Painting Applicators: Qualified in accordance with AISC's Sophisticated Paint Endorsement P1 or to SSPC-QP 3.
- C. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

## 1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
  - 1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
  - 1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
  - 2. Clean and relubricate bolts and nuts that become dry or rusty before use.
  - 3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade F1852 bolt assemblies and for retesting bolt assemblies after lubrication.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Comply with applicable provisions of the following specifications and documents:
  - 1. ANSI/AISC 303.
  - 2. ANSI/AISC 360.
- B. Connection Design Information:

1. Option 3 and 3A: Design connections in accordance with ANSI/AISC 303 by fabricator's qualified professional engineer. Member reinforcement at connections is indicated on Drawings.

## 2.2 STRUCTURAL-STEEL MATERIALS

- A. W-Shapes: ASTM A992/A992M
- B. Channels, Angles, M-Shapes: ASTM A36/A36M.
- C. Plate and Bar: ASTM A36/A36M.
- D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade B structural tubing.
- E. Corrosion-Resisting (Weathering), Cold-Formed Hollow Structural Sections: ASTM A847/A847M structural tubing.
- F. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B.
- G. Welding Electrodes: Comply with AWS requirements.

## 2.3 BOLTS AND CONNECTORS

- A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 (Grade A325M), Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH (ASTM A563M, Class 10S), heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.
- B. Zinc-Coated High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325 (Grade A325M), Type 1, heavy-hex steel structural bolts; ASTM A563, Grade DH (ASTM A563M, Class 10S), heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.
  1. Finish: Hot-dip zinc coating

## 2.4 RODS

- A. Unheaded Anchor Rods: ASTM F1554, Grade 36
  1. Configuration: Straight.
  2. Nuts: ASTM A563 (ASTM A563M) heavy-hex carbon steel.
  3. Plate Washers: ASTM A36/A36M carbon steel.
  4. Washers: ASTM F436 (ASTM F436M), Type 1, hardened carbon steel.
  5. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C.
- B. Headed Anchor Rods: ASTM F1554, Grade 36, straight.

1. Nuts: ASTM A563 (ASTM A563M) heavy-hex carbon steel.
2. Plate Washers: ASTM A36/A36M carbon steel.
3. Washers: ASTM F436 (ASTM F436M), Type 1, hardened carbon steel.
4. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C

C. Threaded Rods: ASTM A36/A36M.

1. Nuts: ASTM A63 (ASTM A563M) heavy-hex carbon steel.
2. Washers: ASTM F436 (ASTM F436M), Type 1, hardened carbon steel.
3. Finish: Hot-dip zinc coating, ASTM A153/A153M, Class C.

## 2.5 PRIMER

A. Steel Primer:

1. Comply with Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

B. Galvanized-Steel Primer: MPI#26.

1. Etching Cleaner: MPI#25, for galvanized steel.
2. Galvanizing Repair Paint: MPI#18, MPI#19, or SSPC-Paint 20.

## 2.6 SHRINKAGE-RESISTANT GROUT

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## 2.7 FABRICATION

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel in accordance with ASTM A6/A6M and maintain markings until structural-steel framing has been erected.
4. Mark and match-mark materials for field assembly.

- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.



- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.
- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted in accordance with SSPC-SP 1.
- F. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.
  - 1. Cut, drill, or punch holes perpendicular to steel surfaces.
  - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
  - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

## 2.8 SHOP CONNECTIONS

- A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened.

## 2.9 GALVANIZING

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel in accordance with ASTM A123/A123M.
  - 1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
  - 2. Galvanize lintels, shelf angles and welded door frames attached to structural-steel frame and located in exterior walls.

## 2.10 SHOP PRIMING

- A. Shop prime steel surfaces, except the following:
  - 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
  - 2. Surfaces to be field welded.
  - 3. Surfaces of high-strength bolted, slip-critical connections.
  - 4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
  - 5. Galvanized surfaces unless indicated to be painted.
  - 6. Corrosion-resisting (weathering) steel surfaces.
  - 7. Surfaces enclosed in interior construction.

- B. Surface Preparation of Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces in accordance with the following specifications and standards:
  - 1. SSPC-SP 2.
- C. Surface Preparation of Galvanized Steel: Prepare galvanized-steel surfaces for shop priming by thoroughly cleaning steel of grease, dirt, oil, flux, and other foreign matter, and treating with etching cleaner.
- D. Priming: Immediately after surface preparation, apply primer in accordance with manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

## 2.11 SOURCE QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform shop tests and inspections.
  - 1. Allow testing agency access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
  - 2. Bolted Connections: Inspect shop-bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
  - 3. Welded Connections: Visually inspect shop-welded connections in accordance with AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
    - 4. Prepare test and inspection reports.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when

permanent structural steel, connections, and bracing are in place unless otherwise indicated on Drawings.

### 3.3 ERECTION

- A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 3. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.
- C. Maintain erection tolerances of structural steel within ANSI/AISC 303.
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure. Slope roof framing members to slopes indicated on Drawings.
- E. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M].
- F. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

### 3.4 FIELD CONNECTIONS

- A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.
  - 1. Joint Type: Snug tightened.
- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

### 3.5 REPAIR

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing, and repair galvanizing to comply with ASTM A780/A780M.
- B. Touchup Painting:
  1. Immediately after erection, clean exposed areas where primer is damaged or missing, and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
    - a. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

### 3.6 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform the following special inspections:
  1. Verify structural-steel materials and inspect steel frame joint details.
  2. Verify weld materials and inspect welds.
  3. Verify connection materials and inspect high-strength bolted connections.
- B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.
  1. Bolted Connections: Inspect bolted connections in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
  2. Welded Connections: Visually inspect field welds in accordance with AWS D1.1/D1.1M.

END OF SECTION 051200

## SECTION 05 4000 COLD-FORMED METAL FRAMING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Formed steel stud exterior wall and interior wall and other framing where indicated on drawings.
  - 1. Delegated design to confirm stud sizes, framing centers and bracing.
- B. Cold formed metal framing at top of elevator to support needed UL fire rated elevator shaft roof.
  - 1. Delegated design to confirm stud sizes, framing centers and bracing.
- C. COLD-FORMED METAL STUD SYSTEM: "C" shaped load bearing steel studs (ASTM C 955) and furring strips shall be spaced 16 inches on center, maximum. Min Uncoated Steel Thickness: 0.0428 inch, Min Flange Width: 1 5/8". Shop Drawings with calculations by a Pennsylvania registered structural engineer are required to be submitted for review and approval by the Architect/Engineer for exterior wall application. Wire tying of framing components is not permitted. Use qualified welders and comply with the American Welding Society (AWS).

#### 1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood blocking and miscellaneous framing.
- B. Section 06 1000 - Rough Carpentry: Roof and wall sheathing.
- C. Section 07 6200 - Sheet Metal Flashing and Trim: Head and sill flashings.
- D. Section 07 9200 - Joint Sealants.
- E. Section 09 2300 - Gypsum Board: Lightweight, non-load bearing metal stud framing.
- F. Section 09 2300 - Gypsum Board: Fire rated shaft wall at elevator hoist way.
- G. Section 09 2216 - Non-Structural Metal Framing.
- H. Section 09 2300 - Gypsum Plastering.
- I. Section 09 2400 - Cement Plastering.

#### 1.03 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members 2016, with Supplement (2020).
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.
- D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.

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COLD-FORMED METAL FRAMING

- E. ASTM C955 - Standard Specification for Cold-Formed Steel Structural Framing Members 2018, with Editorial Revision.
- F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories 2020.
- G. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing 2017.
- H. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.
- I. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

#### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

#### 1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
- C. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
  1. Calculations for loadings and stresses of specially fabricated framing, signed and sealed by a professional structural engineer.
- D. Delegated-Design Submittal: For cold-formed steel framing and connections indicated on Drawings to comply with design loads, include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- E. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention .

#### 1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Member of Steel Stud Manufacturers Association (SSMA): [www.ssma.com/#sle](http://www.ssma.com/#sle).
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Metal Framing:
  - 1. CEMCO: [www.cemcosteel.com/#sle](http://www.cemcosteel.com/#sle).
  - 2. ClarkDietrich: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
  - 3. Jaimes Industries: [www.jaimesind.com/#sle](http://www.jaimesind.com/#sle).
  - 4. Marino: [www.marinoware.com/#sle](http://www.marinoware.com/#sle).
- B. Framing Connectors and Accessories:
  - 1. Same manufacturer as metal framing.
  - 2. ClarkDietrich: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).

### 2.02 FRAMING SYSTEM

- A. COLD-FORMED METAL STUD SYSTEM: "C" shaped load bearing steel studs (ASTM C 955) and furring strips shall be spaced 16 inches on center, maximum. Min Uncoated Steel Thickness: 0.0428 inch, Min Flange Width: 1 5/8". Shop Drawings with calculations by a Pennsylvania registered structural engineer are required to be submitted for review and approval by the Architect/Engineer for exterior wall application. Wire tying of framing components is not permitted. Use qualified welders and comply with the American Welding Society (AWS).
- B. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
- C. Design Requirements: Provide completed framing system having the following characteristics:
  - 1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI S100.
  - 2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
  - 3. Design Loads: Actual dead and live loads and interior wind loading requirements as calculated by the contractor's engineer and additional requirements from the project structural engineer.
  - 4. Design Loads: In accordance with applicable codes.
    - a. Interior Non-Load-Bearing Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft.
    - b. Interior Non-Load-Bearing Framing to Receive Tile Finish: Horizontal deflection of 1/360 of the wall height under a horizontal load of 5 lbf/sq. ft.
    - c. Ceiling and Soffit: Vertical deflection of 1/240 of the span for live loads and 1/240 for total loads of the span
    - d. Floor Live Loads:
      - 1) Minimum Uniformly Distributed: 50 psf.
      - 2) Minimum Concentrated: 1,000 lbs.
    - e. Roof Live Loads:
      - 1) Minimum Uniformly Distributed: .
      - 2) Minimum Concentrated: .
    - f. Wind Loads: positive and negative.
  - 5. Live load deflection meeting the following, unless otherwise indicated:
    - a. Floors: Maximum vertical deflection under live load of 1/480 of span.
    - b. Roofs: Maximum vertical deflection under live load of 1/240 of span.

- c. Exterior Walls: Maximum horizontal deflection under wind load of 1/180 of span.
  - d. Design non-axial loadbearing framing to accommodate not less than 1/2 in vertical deflection.
6. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
  7. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

## 2.03 FRAMING MATERIALS

- A. Studs and Track: ASTM C955; studs formed to channel, C- or Sigma-shaped with punched web; U-shaped track in matching nominal width and compatible height.
  1. Gauge and Depth: As required to meet specified performance levels.
  2. Galvanized in accordance with ASTM A653/A653M, G90/Z275 coating.
  3. Provide components fabricated from ASTM A1008/A1008M Designation SS (structural steel).
  4. Products:
    - a. CEMCO; ProX Header: [www.cemcosteel.com/#sle](http://www.cemcosteel.com/#sle).
    - b. MBA Building Supplies; Structural Studs & Track: [www.mbastuds.com/#sle](http://www.mbastuds.com/#sle).
    - c. Super Stud Building Products, Inc; SuperMAXX Studs: [www.buysuperstud.com/#sle](http://www.buysuperstud.com/#sle).
- B. Jamb Studs: Engineered, C-shaped with wide flanges, designed to replace conventional double-stud framing at openings.
  1. Products:
    - a. SCAFCO Corporation; Kwik-Jamb Studs: [www.scafco.com/#sle](http://www.scafco.com/#sle).
- C. Header: Engineered one-member or two-member assembly, with wide flanges, designed to replace conventional box or nested header framing at openings.
  1. Jamb Mounting Clips: Manufacturer's standard.
  2. Cripple Stud Clips: Manufacturer's standard.
  3. Products:
    - a. SCAFCO Corporation; HD Header: [www.scafco.com/#sle](http://www.scafco.com/#sle).
- D. Framing Connectors: Factory-made, formed steel sheet.
  1. Material: ASTM A653/A653M SS Grade 33 and 40 (minimum), with G90/Z275 hot dipped galvanized coating for base metal thickness less than 10 gauge, 0.1345 inch, and factory punched holes and slots.
  2. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI S100.
  3. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
    - a. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
    - b. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch.
    - c. Products:
      - 1) ClarkDietrich; Drift FastClip Slide Clip D-FCSC: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
      - 2) ClarkDietrich; FastClip Slide Clip FCSC: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).



4. Fixed Connections: Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.
5. Wall Stud Bridging Connections: Provide mechanical load-transferring devices that accommodate wind load torsion and weak axis buckling induced by axial compression loads. Provide bridging connections where indicated on the drawings.
6. Products:
  - a. ClarkDietrich; Spazzer 5400 Bridging Bar: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
  - b. ClarkDietrich; FastBridge Clip: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).

#### 2.04 FASTENERS

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A153/A153M.
- B. Anchorage Devices: Powder actuated.

#### 2.05 WALL SHEATHING

- A. Only as indicated on drawings for select conditions.

#### 2.06 ACCESSORIES

- A. Fabricate steel-framing accessories from ASTM A 1003/A 1003M, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members.
- B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:
  1. Supplementary framing.
  2. Bracing, bridging, and solid blocking.
  3. Web stiffeners.
  4. Anchor clips.
  5. End clips.
  6. Gusset plates.
  7. Stud kickers and knee braces.
  8. Joist hangers and end closures.
  9. Hole-reinforcing plates.
  10. Backer plates.
- C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify field measurements and adjust installation as required.

#### 3.02 INSTALLATION OF STUDS

- A. Install components in accordance with manufacturers' instructions and ASTM C1007 requirements.

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COLD-FORMED METAL FRAMING

3.03 INSTALLATION OF WALL SHEATHING

- A. Install wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.

END OF SECTION 05 4000

## SECTION 05 5000 METAL FABRICATIONS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Shop fabricated steel and aluminum items.
- B. All exterior guardrails and support posts to be black galvanized steel per ASTM A53 unless noted otherwise.
- C. Miscellaneous framing and supports for applications where framing and supports are not specified in other sections including but not limited to rough hardware, loose steel lintels, metal fabric enclosures, supports for building in architectural woodwork.
- D. Miscellaneous framing and supports for applications where framing and support are not specified in other sections including Galvanized Steel Lintels for new masonry openings for doors through existing masonry walls.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 5100 - Metal Stairs.
- D. Section 05 5133 - Metal Ladders; exterior ladders with cages
- E. Section 05 5213 - Pipe and Tube Railings.
- F. Section 09 9000 - Paints and Coatings: Exterior Paint finish.
- G. Section 09 9000 - Paints and Coatings: Interior Paint finish.

#### 1.03 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.
- B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- E. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.
- F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

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METAL FABRICATIONS

- G. ASTM A48/A48M - Standard Specification for Gray Iron Castings 2022.
- H. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- I. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- J. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- K. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications 2022b.
- L. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.
- M. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.
- N. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- O. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.
- P. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing 2021.
- Q. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.
- R. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
- S. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.
- T. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes 2019a.
- U. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire 2019.
- V. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2022.
- W. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
- X. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.
- Y. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).
- Z. AWS D1.2/D1.2M - Structural Welding Code - Aluminum 2014, with Errata (2020).

- AA. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172 2019.
- BB. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.
- CC. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.
- DD. SSPC-SP 2 - Hand Tool Cleaning 2018.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
  - 2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.
    - a. Include the following, as applicable:
      - 1) Design criteria.
      - 2) Engineering analysis depicting stresses and deflections.
      - 3) Member sizes and gauges.
      - 4) Details of connections.
      - 5) Support reactions.
      - 6) Bracing requirements.
- C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- D. WELDER CERTIFICATION: The General Contractor is responsible for submitting for project record and retaining on construction site the welder certifications for any person performing on-site welded steel fabrication or erection. The certifications must be current and validated by welding logs or certification test(s) conducted with the last two (2) years.
- E. Designer's Qualification Statement.
- F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

#### 1.05 QUALITY ASSURANCE

- A. Design connections under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.
- B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.
- C. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.
- D. LINTELS FOR PLUMBING, HVAC, AND ELECTRICAL INSTALLATIONS: furnish lintels for all openings through walls when openings are shown on the architectural or structural drawings. Note all such lintels and openings to require coordination of work and exact locations, by

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METAL FABRICATIONS

affected contractors. All such plumbing, HVAC, electrical, and sprinkler openings must be coordinated and shown on the General Contractor's Systems' Coordination Drawings which must be submitted for Architect/Engineer review and approval.

- E. USE OF INK MARKING PENS ON SURFACES of any kind of materials is prohibited because such marks bleed through paint and other finishes.

## PART 2 PRODUCTS

### 2.01 MATERIALS - STEEL

- A. GALVANIZING REQUIREMENTS: All exterior ferrous metals shall be hot-dip galvanized after fabrication unless noted as Stainless Steel.
- B. Steel Sections: ASTM A36/A36M.
- C. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- D. Plates: ASTM A283/A283M.
- E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- F. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
- G. Galvanized Steel Lintels for new masonry openings for doors through existing masonry walls (and repair/replacement of existing lintels for existing window openings as indicated) to comply with building code and requirements here within and are required to have complete flashing; refer to Division 7 Sections.

### 2.02 MATERIALS - ALUMINUM

### 2.03 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

### 2.04 FABRICATED ITEMS

- A. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.
- B. Lintels: As detailed; prime paint finish.
- C. Door Frames for Overhead Door Openings, Wall Openings, and windows: Channel sections; prime paint finish.

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METAL FABRICATIONS

- 2.05 Dark Bronze metal picket security fence with vandal proof curved top
- A. information to follow
- 2.06 FINISHES - STEEL
- A. Prime paint steel items.
    - 1. Exceptions: Galvanize items to be embedded in concrete, items to be embedded in masonry, and items specified for galvanized finish.
  - B. Prepare surfaces to be primed in accordance with SSPC-SP2.
  - C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
  - D. Prime Painting: One coat.
  - E. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.
  - F. Stainless Steel Finish: No. 4 Bright Polished finish.
- 2.07 FINISHES - ALUMINUM
- A. Exterior Aluminum Surfaces: Class I color anodized.
  - B. Class II Color Anodized Finish: AAMA 611 AA-M12C22A32 Integrally colored anodic coating not less than 0.4 mils thick; light bronze.
  - C. Class II Color Anodized Finish: AAMA 611 AA-M12C22A34 Electrolytically deposited colored anodic coating not less than 0.4 mils thick; light bronze.
  - D. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish; color as indicated.
  - E. High Performance Organic Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system; color as indicated.
    - 1. Manufacturers:
      - a. Sherwin-Williams Company; POLANE Solar Reflective 2K Urethane Enamel: [oem.sherwin-williams.com/#sle](http://oem.sherwin-williams.com/#sle).
- 2.08 FABRICATION TOLERANCES
- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
  - B. Maximum Offset Between Faces: 1/16 inch.
  - C. Maximum Misalignment of Adjacent Members: 1/16 inch.
  - D. Maximum Bow: 1/8 inch in 48 inches.
  - E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

### 3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

### 3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Obtain approval prior to site cutting or making adjustments not scheduled.

### 3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 5000



## SECTION 05 5100 METAL STAIRS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Delegated Design Exterior Stair system with platforms including the following:
- B. Stairs with metal treads.
- C. Stairs with grating treads.
- D. Delegated Design Prefabricated stairs are acceptable.
- E. Delegated Design Structural steel stair framing and supports.
- F. Handrails and guards.
  - 1. Provide all to be black galvanized steel per ASTM A53
- G. Prefabricated stair treads and nosings are acceptable.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of metal anchors in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 05 5000 - Metal Fabrications.
- D. Section 05 5213 - Pipe and Tube Railings: Metal handrails and balusters other than specified in this section.
- E. Section 09 9000 - Paints and Coatings: Exterior and Interior Paint finish.

#### 1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- B. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures 2006.
- C. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling 2022.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- E. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- G. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

- H. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.
  - I. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.
  - J. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
  - K. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.
  - L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2022.
  - M. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
  - N. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.
  - O. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).
  - P. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172 2019.
  - Q. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
  - R. NAAMM AMP 510 - Metal Stairs Manual 1992.
  - S. NAAMM MBG 531 - Metal Bar Grating Manual 2017.
  - T. NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual 2019.
  - U. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.
  - V. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.
  - W. SSPC-SP 2 - Hand Tool Cleaning 2018.
- 1.04 SUBMITTALS
- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
  - B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
    - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
  - C. Design Data: As required by authorities having jurisdiction.
  - D. Design Data, Seismic Performance: Submit documentation that stairs meet performance requirements specified.
  - E. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

- F. Designer's Qualification Statement.
- G. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is certified under AISC 201.
- H. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

#### 1.05 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
- B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and dated no more than 12 months before start of scheduled welding work.
- C. Fabricator Qualifications:
  - 1. A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
  - 2. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Prefabricated Metal Stairs:
  - 1. Cutting Edge Steel; Cutting Edge Stair: [www.cesteel.com/#sle](http://www.cesteel.com/#sle).
  - 2. Lapeyre Stair, Inc: [www.lapeyrestair.com/#sle](http://www.lapeyrestair.com/#sle).
  - 3. Pacific Stair Corporation: [www.pacificstair.com/#sle](http://www.pacificstair.com/#sle).
  - 4. Precision Ladders, LLC; Aluminum Alternating Tread Stairs: [www.precisionladders.com/#sle](http://www.precisionladders.com/#sle).
- B. Factory Fabricated Stair Treads and Nosings:
  - 1. Balco, Inc; Stair Nosings: [www.balcousa.com/#sle](http://www.balcousa.com/#sle).
  - 2. Eagle Mouldings, Inc: [www.eagle-aluminum.com/#sle](http://www.eagle-aluminum.com/#sle).
  - 3. Ecoglo, Inc: [www.ecoglo.us/#sle](http://www.ecoglo.us/#sle).
  - 4. Nystrom, Inc: [www.nystrom.com/#sle](http://www.nystrom.com/#sle).
  - 5. Pacific Stair Corporation; Quiet Tread: [www.pacificstair.com/#sle](http://www.pacificstair.com/#sle).
  - 6. Ross Technology Corporation: [www.rosstechnology.com/#sle](http://www.rosstechnology.com/#sle).
  - 7. Wooster Products, Inc; Alumogrit Type 101: [www.woosterproducts.com/#sle](http://www.woosterproducts.com/#sle).

#### 2.02 METAL STAIRS - GENERAL

- A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
  - 1. Regulatory Requirements: Provide stairs and railings that comply with most stringent requirements of local, state, and federal regulations; where requirements of Contract Documents exceed those of regulations, comply with Contract Documents.
  - 2. Dimensions: As indicated on drawings.

3. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
4. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
5. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:

1. Commercial: Exposed joints as inconspicuous as possible, whether welded or mechanical; underside of stair not covered by soffit IS considered exposed to view.
  - a. Welded Joints: Intermittently welded on back side, filled with body putty, and sanded smooth and flush.
  - b. Welds Exposed to View: Ground smooth and flush.
  - c. Mechanical Joints: Butted tight, flush, and hairline.
  - d. Bolts Exposed to View: Countersunk flat or oval head bolts; no exposed nuts.
  - e. Exposed Edges and Corners: Eased to small uniform radius.
  - f. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for satin or matte finish.

C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

## 2.03 HANDRAILS AND GUARDS

A. Guards:

1. Top Rails: Round pipe or tube rails unless otherwise indicated.
  - a. Outside Diameter: 1-1/4 inch, minimum, to 1-1/2 inches, maximum.
2. End and Intermediate Posts: Same material and size as top rails.
  - a. Horizontal Spacing: As indicated on drawings.
  - b. Mounting: Welded to top surface of stringer.

## 2.04 MATERIALS

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A500/A500M or ASTM A501/A501M structural tubing, round and shapes as indicated.

C. Pipe: ASTM A53/A53M Grade B Schedule 40, black finish.

## 2.05 ACCESSORIES

A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.

B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

C. Shop and Touch-Up Primer: SSPC-Paint 15, and comply with VOC limitations of authorities having jurisdiction.

D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, and comply with VOC limitations of authorities having jurisdiction.

## 2.06 SHOP FINISHING

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime Painting: Use specified shop- and touch-up primer.
  - 1. Preparation of Steel: In accordance with SSPC-SP 2 Hand Tool Cleaning.
  - 2. Number of Coats: One.
- D. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A123/A123M.
  - 1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

### 3.02 PREPARATION

- A. When field welding is required, clean and strip primed steel items to bare metal.
- B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

### 3.03 INSTALLATION

- A. Install components plumb and level, accurately fitted, free from distortion or defects.
- B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
- D. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
- E. Obtain approval prior to site cutting or creating adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

### 3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.05 SCHEDULES

- A. Stair C: Checkered plate treads and landings, with galvanized finish. Pipe handrails, see Section 05 5213.

END OF SECTION 05 5100

## SECTION 05 5133 METAL LADDERS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Delegated Design Shop-fabricated metal ladders.
  - 1. Exterior ladders with OSHA fall cages to access both gym and boxing ring roofs.
  - 2. Interior steel ladder in attic to roof hatch.
  - 3. Interior steel ladder at access to attic
  - 4. Delegated Design.
- B. Prefabricated ladders; as possible if existing conditions permit and aluminium allowed.

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications
- B. Section 05 5100 - Metal Stairs.
- C. Section 05 5213 - Pipe and Tube Railings.
- D. Section 09 9000 - Paint and Coatings: Exterior Paint finish.
- E. Section 09 9000 - Paints and Coatings: Interior Paint finish.

#### 1.03 REFERENCE STANDARDS

- A. 29 CFR 1910.23 - Ladders Current Edition.
- B. 29 CFR 1926.1053 - Ladders Current Edition.
- C. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.
- D. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- E. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- F. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- G. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements 2008 (Reaffirmed 2018).
- H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- I. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

- J. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- K. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- L. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates 2018.
- M. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.
- N. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- O. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.
- P. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.
- Q. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.
- R. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings 2018, with Editorial Revision.
- S. ASTM B85/B85M - Standard Specification for Aluminum-Alloy Die Castings 2018, with Editorial Revision.
- T. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2021a.
- U. ASTM B210/B210M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes 2019a.
- V. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire 2019.
- W. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2022.
- X. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
- Y. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.
- Z. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).
- AA. AWS D1.2/D1.2M - Structural Welding Code - Aluminum 2014, with Errata (2020).
- BB. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172 2019.
- CC. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.



- DD. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.
- EE. SSPC-SP 2 - Hand Tool Cleaning 2018.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings:
  - 1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
  - 2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
- C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- D. Designer's Qualification Statement.
- E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

#### 1.05 QUALITY ASSURANCE

- A. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.2/D1.2M and dated no more than 12 months before start of scheduled welding work.
- B. Fabricator Qualifications: A qualified steel fabricator that is accredited by IAS AC172.

### PART 2 PRODUCTS

#### 2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
- C. Plates: ASTM A283/A283M.
- D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
- E. Mechanical Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.
- F. Bolts, Nuts, and Washers: ASTM A307, plain.
- G. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.
- H. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

- J. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

## 2.02 MATERIALS - ALUMINUM

- A. Extruded Aluminum: ASTM B211/B211M, 6063 alloy, T6 temper.
- B. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.
- C. Aluminum-Alloy Drawn Seamless Tubes: ASTM B210/B210M, 6063 alloy, T6 temper.
- D. Aluminum-Alloy Bars: ASTM B211/B211M, 6061 alloy, T6 temper.
- E. Aluminum-Alloy Sand Castings: ASTM B26/B26M.
- F. Aluminum-Alloy Die Castings: ASTM B85/B85M .
- G. Bolts, Nuts, and Washers: Stainless steel.
- H. Welding Materials: AWS D1.2/D1.2M; type required for materials being welded.

## 2.03 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

## 2.04 FABRICATED LADDERS

- A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
  - 1. Side Rails: 3/8 by 2 inches members spaced at 20 inches.
  - 2. Rungs: One inch diameter solid round bar spaced 12 inches on center.
  - 3. Space rungs 7 inches from wall surface.

## 2.05 PREFABRICATED LADDERS

- A. Prefabricated Ladder: Welded metal unit complying with ANSI A14.3; factory fabricated to greatest degree practical and in the largest components possible.
  - 1. Components: Manufacturer's standard rails, rungs, treads, handrails, returns, platforms and safety devices complying with the requirements of the MATERIALS article of this section.
  - 2. Materials: Aluminum; ASTM B211/B211M 6063 alloy, T52 temper.
  - 3. Finish: Powder coat; color to be selected by Architect from manufacturer's standard range.
  - 4. Manufacturers:
    - a. Industrial Ladder & Scaffolding, Inc.: [www.anyladder.com/#sle](http://www.anyladder.com/#sle).

- b. O'Keeffe's Inc; Model 500: [www.okeeffes.com/#sle](http://www.okeeffes.com/#sle).
- c. Precision Ladders, LLC; Fixed Aluminium Wall Ladder: [www.precisionladders.com/#sle](http://www.precisionladders.com/#sle).

## 2.06 FINISHES - STEEL

- A. Prime paint steel items.
  - 1. Do not prime surfaces in direct contact with concrete.
  - 2. Do not prime surfaces where field welding is required.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- D. Prime Painting: One coat.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 1.7 oz/sq ft galvanized coating.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

## 2.07 FINISHES - ALUMINUM

- A. Exterior Aluminum Surfaces: Class I natural anodized.
- B. Interior Aluminum Surfaces: Class I natural anodized.
- C. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
- D. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick; light bronze.
- E. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick; light bronze.
- F. Class II Color Anodized Finish: AAMA 611 AA-M12C22A34 Electrolytically deposited colored anodic coating not less than 0.4 mils thick; light bronze.
- G. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish; color as indicated.
- H. High Performance Organic Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system; color as indicated.
- I. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system; color as indicated.
- J. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

## 2.08 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS - PACKAGE #2

- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

#### 3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.

#### 3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components as indicated on drawings.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.

#### 3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 5133

## **SECTION 055213 - PIPE AND TUBE RAILINGS**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section Includes:

- 1. Aluminum pipe and tube railings.

- B. Related Requirements:

- 1. Section 033000 "Cast-in-Place Concrete" for concrete work.
  - 2. Section 321313 "Concrete Paving" for concrete sidewalks and stairs.
  - 3. Section 321373 "Concrete Paving Joint Sealants"

#### **1.3 COORDINATION**

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

#### **1.4 ACTION SUBMITTALS**

- A. Product Data: For the following:

- 1. Manufacturer's product lines of mechanically connected railings.
  - 2. Grout and anchoring cement.

- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

- C. Samples: For each type of exposed finish required.

Issue for Bid

1. Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters, including finish.
  2. Fittings and brackets.
- D. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- D. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E894 and ASTM E935.
- E. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
  1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Aluminum Pipe and Tube Railings:
  1. Manufacturer experienced in fabrication of work specified.

- B. Source Limitations: Obtain each type of railing from single source from single manufacturer.

## 2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design railings, including attachment to building construction.
- B. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
  - 1. Handrails and Top Rails of Guards:
    - a. Uniform load of 50 lbf/ ft. applied in any direction.
    - b. Concentrated load of 200 lbf applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
  - 2. Infill of Guards:
    - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft..
    - b. Infill load and other loads need not be assumed to act concurrently.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
  - 1. Temperature Change: 120 deg F ambient; 180 deg F material surfaces.

## 2.3 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

## 2.4 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
- B. Extruded Structural Pipe and Round Tubing: ASTM B429, Alloy 6063-T6.
  - 1. Provide Standard Weight (Schedule 40) pipe unless otherwise indicated.
- C. Castings: ASTM B26, Alloy A356.0-T6.

## 2.5 FASTENERS

- A. General: Provide the following:
  - 1. For Aluminum Railings: Stainless-steel fasteners.
  - 2. Provide exposed fasteners with finish matching appearance, including color and texture, of railings.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Fasteners for Interconnecting Railing Components:
  - 1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
  - 2. Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

## 2.6 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
  - 1. For aluminum railings, provide type and alloy as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
  - 1. Water-Resistant Product: [At exterior locations] [and] [where indicated] provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.



## 2.7 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage[, but not less than that required to support structural loads].
- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with either welded or nonwelded connections unless otherwise indicated.
- H. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.
- I. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
  - 1. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
- J. Form Changes in Direction as Follows:
  - 1. As detailed.
  - 2. By radius bends of radius indicated.
- K. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- L. Close exposed ends of railing members with prefabricated end fittings.
- M. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

Issue for Bid

- N. For railing posts set in concrete, provide PVC sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate

2.8 ALUMINUM FINISHES

- A. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are unacceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- B. Mill Finish: AA-M12, nonspecular as fabricated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
  - 1. Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
  - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
  - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
  - 1. Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.

- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

### 3.3 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.
- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

### 3.4 ANCHORING POSTS

- A. Use PVC sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.

### 3.5 ADJUSTING AND CLEANING

- A. Clean aluminum by washing thoroughly with clean water and soap and rinsing with clean water.

### 3.6 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 055213

SECTION 05 5214  
PIPE AND TUBE RAILINGS (ATTACHED TO BUILDING)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall and guardrail mounted handrails.
- B. Dark Bronze (black galvanized steel per ASTM A53) metal picket security guardrail where indicated on drawings at roof.
- C. Dark Bronze Anodized Aluminum guardrail at exterior stair well (wall and deck mounted) and as indicated on drawings for main entry step mounted handrail.
- D. Ramp railings and guardrails.
- E. Free-standing railings at main entry ramp.
- F. All exterior Handrails and guardrails to be black galvanized steel per ASTM A53 UNO.
- G. Balcony railings and guardrails.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.
- B. Section 04 2000 - Unit Masonry: Placement of anchors in masonry.
- C. Section 05 5100 - Metal Stairs: Handrails other than those specified in this section.
- D. Section 05 5100 - Metal Stairs: Attachment plates for handrails specified in this section.
- E. Section 06 2000 - Finish Carpentry: Wood handrail repair.
- F. Section 09 2116 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.
- G. Section 09 9000 - Paints and Coatings: Exterior and Interior Paint finish.

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.
- B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.

- D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- E. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- F. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures 2006.
- G. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2022.
- H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2021.
- K. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings 2020.
- L. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating 2011 (Reapproved 2021).
- M. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire 2019.
- N. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube 2022.
- O. ASTM B429/B429M - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube 2020.
- P. ASTM B483/B483M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Tube and Drawn Pipe for General Purpose Applications 2021.
- Q. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings 2021.
- R. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.
- S. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).
- T. AWS D1.6/D1.6M - Structural Welding Code - Stainless Steel 2017, with Amendment (2021).
- U. AWS C3.4M/C3.4 - Specification for Torch Brazing 2016.
- V. AWS C3.5M/C3.5 - Specification for Induction Brazing 2016, with Amendment (2017).
- W. AWS C3.9M/C3.9 - Specification for Resistance Brazing 2020.
- X. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
- C. Samples: Submit two, 6 inch long samples of handrail. Submit two samples of elbow, wall bracket, and end stop.
- D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated within the previous 12 months.

#### 1.05 QUALITY ASSURANCE

- A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.
- B. Fabricator Qualifications:
  - 1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Handrails and Railings:
  - 1. Alumi-Guard: [www.alumi-guard.com/#sle](http://www.alumi-guard.com/#sle).
  - 2. Avcon Railing Systems; Presidential Aluminum: [www.avcon.com/#sle](http://www.avcon.com/#sle).
  - 3. ATR Technologies Inc; Aluminum Multi-Line Railing: <http://www.atr-technologies.com/#sle>.
  - 4. Kee Safety, Inc; Kee Klamp (steel): [www.keesafety.com/#sle](http://www.keesafety.com/#sle).
  - 5. KaneSterling: [www.sterlingdula.com/#sle](http://www.sterlingdula.com/#sle).
  - 6. Spaceguard Products; BeastWire Mezzanine Safety Railguard System: [www.spaceguardproducts.com/#sle](http://www.spaceguardproducts.com/#sle).
  - 7. The Wagner Companies: [www.wagnercompanies.com/#sle](http://www.wagnercompanies.com/#sle).
- B. Non-Weld Pipe Fittings:
  - 1. Kee Safety, Inc; Kee Klamp (steel): [www.keesafety.com/#sle](http://www.keesafety.com/#sle).
- C. Metal Rail Infill:
  - 1. The G-S Company: [www.g-sco.com/#sle](http://www.g-sco.com/#sle).
  - 2. The Western Group; Woven Wire: [www.architecturalwire.com/#sle](http://www.architecturalwire.com/#sle).
- D. Metal Cable Infill:
- E. Accessibility-Compliant Handrail Brackets:
  - 1. Rakks/Rangine Corporation; ADA Compliant HR-202: [www.rakks.com/#sle](http://www.rakks.com/#sle).

## 2.02 RAILINGS - GENERAL REQUIREMENTS

- A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.
- B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935
- D. Allow for expansion and contraction of members and building movement without damage to connections or members.
- E. Dimensions: See drawings for configurations and heights.
  - 1. Top Rails and Wall Rails: 1-1/2 inches diameter, round.
  - 2. Top Rails and Wall Rails: Wood rails, specified in Section 06 2000.
  - 3. Intermediate Rails: 1-1/2 inches diameter, round.
  - 4. Intermediate Rails: 1-1/4 by 1 inch rectangular.
  - 5. Posts: 1-1/2 inches diameter, round.
  - 6. Posts: 1-1/2 inches square.
  - 7. Balusters: 1/2 inch square solid bar.
- F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
  - 1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
  - 2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
  - 3. For anchorage to stud walls, provide backing plates, for bolting anchors.
- G. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.
- H. Welded and Brazed Joints: Make visible joints butt tight, flush, and hairline; use methods that avoid discoloration and damage of finish; grind smooth, polish, and restore to required finish.
  - 1. Ease exposed edges to a small uniform radius.
  - 2. Welded Joints:
    - a. Carbon Steel: Perform welding in accordance with AWS D1.1/D1.1M.
    - b. Stainless Steel: Perform welding in accordance with AWS D1.6/D1.6M.
  - 3. Brass/Bronze Brazed Joints:
    - a. Perform torch brazing in accordance with AWS C3.4M/C3.4.
    - b. Perform induction brazing in accordance with AWS C3.5M/C 3.5.
    - c. Perform resistance brazing in accordance with AWS C3.9M/C3.9.

## 2.03 ALUMINUM MATERIALS

- A. Aluminum Pipe: Schedule 40; ASTM B429/B429M, ASTM B241/B241M, or ASTM B483/B483M.

- B. Aluminum Tube: Minimum wall thickness of 0.127 inch; ASTM B429/B429M, ASTM B241/B241M, or ASTM B483/B483M.
- C. Solid Bars and Flats: ASTM B211/B211M.
- D. Non-Weld Mechanical Fittings: Slip-on cast aluminum, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- E. Welding Fittings: No exposed fasteners; cast aluminum.
- F. Straight Splice Connectors: Concealed spigot; cast aluminum.
- G. Exposed Fasteners: No exposed bolts or screws.

#### 2.04 STEEL RAILING SYSTEM

- A. Steel Tube: ASTM A500/A500M Grade B cold-formed structural tubing.
- B. Handrails and guardrails to be of stainless steel construction. Comply with ASCE "Specification for the Design of Cold-Formed Stainless Steel Structural Members." Bright, Directional Polish: Match AISI No. 4 finish.
- C. Steel Pipe: ASTM A53/A53M Grade B Schedule 80, black finish.
- D. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.
- E. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.
- F. Exposed Fasteners: No exposed bolts or screws.
- G. Straight Splice Connectors: Steel concealed spigots.
- H. Galvanizing: In accordance with requirements of ASTM A123/A123M.
  - 1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.
- I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

#### 2.05 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.
- D. Welded Joints:
  - 1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
  - 2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.



3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Weld connections that cannot be shop welded due to size limitations.
  1. Weld in accordance with AWS D1.1/D1.1M.
  2. Match shop welding and bolting.
  3. Clean welds, bolted connections, and abraded areas.
  4. Touch up shop primer and factory-applied finishes.
  5. Repair galvanizing with galvanizing repair paint per ASTM A780/A780M.

## 2.06 ALUMINUM FINISHES

- A. The following with approval are acceptable options to achieve color goals for special hand and guardrails at locations indicated on drawings:
- B. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.
- C. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.
- D. Class II Color Anodized Finish: AAMA 611 AA-M12C22A32 Integrally colored anodic coating not less than 0.4 mils thick.
- E. Class II Color Anodized Finish: AAMA 611 AA-M12C22A34 Electrolytically deposited colored anodic coating not less than 0.4 mils thick.
- F. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish.
- G. High Performance Organic Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system.
- H. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.
- I. Color: To be selected by Architect from manufacturer's standard line.
- J. Touch-Up Materials: As recommended by coating manufacturer for field application.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

### 3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.
- C. Apply one coat of bituminous paint to concealed aluminum surfaces that will be in contact with cementitious or dissimilar materials.

### 3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.
- C. Install railings in compliance with ADA Standards for accessible design at applicable locations.
- D. Anchor railings securely to structure.
- E. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.
- F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

### 3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

### 3.05 SCHEDULE

- A. Interior Ramp: Handrails and guardrails to be of stainless steel construction. Comply with ASCE "Specification for the Design of Cold-Formed Stainless Steel Structural Members." Bright, Directional Polish: Match AISI No. 4 finish.

END OF SECTION 05 5213

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## SECTION 06 1000 ROUGH CARPENTRY

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Section 05 5000-Metal Fabrications: Miscellaneous steel connectors and support angles for wood framing.
- C. Section 07 6200-Sheet Metal Flashing and Trim: Sill flashings.
- D. Section 07 7200-Roof Accessories: Prefabricated roof curbs.

#### 1.02 SUMMARY

- A. Section Includes:
  - 1. Wood blocking and nailers.
  - 2. Plywood backing panels and decking where indicated on drawings.
  - 3. Fire retardant treated wood materials.
  - 4. Fire retardant treated Wood studs for patching or extending existing walls.
  - 5. Other misc wood framing and bracing.

#### 1.03 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2016.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2020.
- D. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2019.
- E. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2012, with Editorial Revision (2019).
- F. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).
- G. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2019.
- H. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.
- I. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2021.
- J. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS - PACKAGE #2

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ROUGH CARPENTRY

- K. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).
- L. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2016.
- M. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing; 2019a.
- N. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.
- O. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies; 2018.
- P. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2021a.
- Q. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2021.
- R. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C; 2019a.
- S. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015 (Reapproved 2021)e1.
- T. AWC (WFCM) - Wood Frame Construction Manual for One- and Two-Family Dwellings; 2018, with Errata (2019).
- U. AWPA U1 - Use Category System: User Specification for Treated Wood; 2021.
- V. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- W. ICC (IECC) - International Energy Conservation Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- X. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; 2016, with Editorial Revision (2019).
- Y. ICC-ES AC310 - Acceptance Criteria for Water-resistive Membranes Factory-bonded to Wood-based Structural Sheathing, Used as Water-Resistive Barriers; 2008, with Editorial Revision (2015).
- Z. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2014, with Editorial Revision (2017).
- AA. NELMA (SGR) - Standard Grading Rules for Northeastern Lumber; 2021.
- BB. PS 1 - Structural Plywood; 2009 (Revised 2019).
- CC. PS 2 - Performance Standard for Wood Structural Panels; 2018.
- DD. PS 20 - American Softwood Lumber Standard; 2020.
- EE. RIS (GR) - Standard Specifications for Grades of California Redwood Lumber; 2019.

FF. SPIB (GR) - Grading Rules; 2014.

GG. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2018.

HH. WWPA G-5 - Western Lumber Grading Rules; 2021.

#### 1.04 PRODUCT HANDLING

- A. Stack lumber and plywood; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

### PART 2 - PRODUCTS

#### 2.01 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
  3. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
- B. Plywood Panels:
1. Plywood: DOC PS 1.
  2. Thickness: As needed to comply with requirements specified but not less than thickness indicated.
  3. Factory mark panels according to indicated standard.

#### 2.02 ROOF SHEATHING and select masonry opening infill Cavity Wall Sheathing.

- A. Plywood Sheathing: Marine Grade Plywood Exposure 1 sheathing; where indicated on drawings.
1. Nominal Thickness: Not less than 15/32 inch
    - a. Roof Cover Board:
  2. Basis of Design: Marine Grade Plywood
  3. For marine grade plywood, high temperature self-adhering underlayment at days end.
- B. Fiberglass Mat Gypsum Roof Cover Board; where indicated on drawings.
1. Fiberglass Faced, Polyisocyanurate-Foam Sheathing: ASTM C1289, Type I or Type II, Class 2, rigid, cellular, polyisocyanurate thermal insulation. Foam-plastic core and facings shall have a flame-spread index of 25 or less when tested individually.
  2. Basis of Design: DensDeck, Georgia-Pacific
  3. Manufacturers: Subject to compliance with requirements, provide products by one of the following: As indicated and:
  4. Thickness: 1/2 inch Or As otherwise indicated at special conditions.
  5. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.
- C. Oriented-Strand-Board Sheathing: DOC PS 2, sheathing:
1. Nominal Thickness: **1/2 inch**.

2. Provide 5/8" glass fiber Cavity Wall Sheathing at existing masonry opening infill as shown on drawings.

## 2.03 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
- B. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
- C. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.
- D. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
  1. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
  2. Treat exterior rough carpentry items.
  3. Treat exposed exterior rough carpentry items, including stairways, balconies, and covered walkways
  4. Do not use treated wood in direct contact with the ground.
- E. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
  1. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
  2. Interior rough carpentry items are to be fire retardant treated.
  3. Treat rough carpentry items as indicated .
  4. Do not use treated wood in applications exposed to weather or where the wood may become wet.

## 2.04 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA UC2 (lumber) and AWPA UC3 (plywood).
  1. Preservative Chemical: Ammoniacal, or amine, copper quat (ACQ).
  2. Do not use chemicals containing chromium or arsenic.
- B. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood. Do not use material that is warped or does not comply with requirements for untreated material.
- C. Mark each treated item with the treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
  1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.

2. Wood sills, sleepers, blocking, stripping, and similar concealed members in contact with masonry or concrete.

## 2.05 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Miscellaneous Lumber: Provide lumber for support or attachment of other construction, including blocking and nailers.
- C. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 19 percent maximum moisture content and any of the following species:
  1. Mixed southern pine; SPIB.
  2. Hem-fir or Hem-fir (north); NLGA, WCLIB, or WWPA.
  3. Spruce-pine-fir (south) or Spruce-pine-fir; NELMA, NLGA, WCLIB, or WWPA.
  4. Eastern softwoods; NELMA.
  5. Northern species; NLGA.
  6. Western woods; WCLIB or WWPA.

## 2.06 PLYWOOD PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch thick.

## 2.07 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
  1. Where miscellaneous carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
  2. Where miscellaneous carpentry is preservative-treated, provide fasteners of Type 304 or Type 316 stainless steel.
- B. Nails: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- F. Roof Sheathing Fasteners: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
  1. For roof parapet and wall sheathing, provide fasteners with **hot-dip zinc coating complying with ASTM A153/A153M and where indicated of Type 304 stainless steel.**
  2. For **roof parapet and wall** sheathing, provide fasteners with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B117.
  3. Nails, Brads, and Staples: ASTM F1667.
  4. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.



- G. Expansion Anchors: (not permitted in exterior masonry unless needed and only with written approval) Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
  - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- C. Securely attach carpentry work as indicated and according to applicable codes and recognized standards.
- D. Use fasteners of appropriate type and length. Pre-drill members when necessary to avoid splitting wood.
- E. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- F. Cut sheathing panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- G. Securely attach sheathing panels to substrate by fastening as indicated, complying with the following:
  - 1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
  - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in the ICC's International Residential Code for One- and Two-Family Dwellings.
  - 3. ICC-ES evaluation report for fastener.
- H. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- I. Coordinate roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- J. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- K. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

### 3.02 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
  - 1. Roof Sheathing:
    - a. Nail to wood framing
    - b. Screw to cold-formed metal framing.
    - c. Space panels 1/8 inch apart at edges and ends.

### 3.03 WOOD BLOCKING AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

### 3.04 PLYWOOD PANEL INSTALLATION

- A. Plywood Panels: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.

END OF SECTION 06 1000

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## SECTION 06 2000 FINISH CARPENTRY

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Finish carpentry items as indicated on drawings including the following:
- B. Wood door frames, glazed frames.
- C. Wood casings and moldings.
- D. Dutchman repairs of existing window sill, frame and molding.
- E. Restore exterior fascia, skirting and surround of wood dormers.
- F. Hardware and attachment accessories.
- G. Other existing wood work indicated on drawings to be repaired / restored / replaced in kind.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- C. Section 06 4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.
- D. Division 8 Sections for Windows and Doors in regard to existing wood trim repair as indicated on drawings.
- E. Section 09 9000 - PAINTS and COATINGS: Painting of finish carpentry items.
- F. Section 12 3600-Countertops and as indicated on drawings.

#### 1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials Current Edition.
- B. ANSI A135.4 - Basic Hardboard 2012 (Reaffirmed 2020).
- C. ANSI A208.1 - American National Standard for Particleboard 2022.
- D. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test 2015 (Reaffirmed 2020).
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- F. ASTM C1036 - Standard Specification for Flat Glass 2021.
- G. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.

- H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
- I. AWI (QCP) - Quality Certification Program Current Edition.
- J. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).
- K. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards 2021, with Errata.
- L. AWPA U1 - Use Category System: User Specification for Treated Wood 2022.
- M. BHMA A156.9 - Cabinet Hardware 2020.
- N. GSA CID A-A-1936 - Adhesives, Contact, Neoprene Rubber 1996a (Validated 2013).
- O. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood 2020.
- P. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- Q. NHLA G-101 - Rules for the Measurement and Inspection of Hardwood and Cypress 2019.
- R. PS 1 - Structural Plywood 2019.
- S. PS 20 - American Softwood Lumber Standard 2021.
- T. WDMA I.S. 4 - Industry Specification for Preservative Treatment for Millwork 2019.
- U. WI (CCP) - Certified Compliance Program (CCP) Current Edition.

#### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with plumbing rough-in, electrical rough-in, installation of associated and adjacent components, and as shown on drawings.

#### 1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data:
  1. Provide manufacturer's product data, storage and handling instructions for factory-fabricated units.
  2. Provide data on fire retardant treatment materials and application instructions.
- C. Shop Drawings: Indicate materials, component profiles and elevations matching existing decorative trim, moulding, brackets, window sills, dormer fascia, skirting, mullions, dormer casing at roof flashing, fastening methods, jointing details, and accessories.
- D. Samples: Submit two samples of wood trim 6 inch long.

#### 1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
  1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

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FINISH CARPENTRY

- B. Quality Certification:
1. Comply with WI (CCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section [www.woodworkinstitute.com/#sle](http://www.woodworkinstitute.com/#sle).
  2. Provide labels or certificates indicating that work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
  3. Provide designated labels on shop drawings as required by certification program.
  4. Provide designated labels on installed products as required by certification program.
  5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

#### 1.07 MOCK-UPS

- A. Window Trim Restoration Mock-up.
- B. Locate where directed.
- C. Mock-up may remain as part of the work.

#### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver factory-fabricated units to project site in original packages, containers or bundles bearing brand name and identification.
- B. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.
- C. Protect from moisture damage.
- D. Handle materials and products to prevent damage to edges, ends, or surfaces.

### PART 2 PRODUCTS

#### 2.01 FINISH CARPENTRY ITEMS

- A. Wood restoration products; Use Abatron Wood Restoration System with Liquid Wood consolidate, Wood Epoxy fillers and accessory wood preservation products, or equal.
- B. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- C. Exterior Woodwork Items:
  1. Window Casings and Moldings: Softwood; prepare for paint finish.

#### 2.02 WOOD-BASED COMPONENTS

- A. Provide sustainably harvested wood, certified or labeled as specified in Section 01 6000 - Product Requirements.

#### 2.03 LUMBER MATERIALS

- A. Softwood Lumber: Radiata Pine, Accoya and Tricoya species, Common sawn, Accoya acetylated wood with a maximum moisture content of 3-5 percent; with vertical grain, A1 grade.

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FINISH CARPENTRY

B. Manufactured Panels: Tricoya treated wood panel.

#### 2.04 SHEET MATERIALS

A. Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

#### 2.05 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

#### 2.06 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Wood Filler: Solvent base, tinted to match surface finish color.

#### 2.07 HARDWARE

A. Hardware: Comply with BHMA A156.9.

B. Defer to Hardware section for Keying system.

C. Americans with Disabilities Act (ADA)-Compliant Vanity and Countertop Brackets:

1. Material: Steel.

2. Finish: Manufacturer's standard, factory-applied primer.

D. Specialty Vanity Brackets:

1. Material: Steel.

2. Finish: Manufacturer's standard, factory-applied, textured powder coat.

3. Color: White.

#### 2.08 WOOD TREATMENT

A. Grading: In accordance with rules certified by ALSC; [www.alsc.org](http://www.alsc.org); ICC ESR 2825; FSC Certified WDMA I.S 4-15A, Cradle to Cradle: GOLD Overall; Platinum in Material Health.

B. Grading: Provide A1 grade lumber.

C. Factory-Treated Lumber: Comply with requirements of AWWA U1 - Use Category System for pressure impregnated wood treatments determined by use categories, expected service conditions, and specific applications.

D. Wood Preservative (Surface Application): Colored, as indicated on drawings type, as indicated on drawings.

E. Redry wood after pressure treatment to maximum 3-5 percent moisture content.

#### 2.09 SITE FINISHING MATERIALS

A. Stain, Shellac, Varnish, and Finishing Materials: Comply with AWI/AWMA/WI (AWS) or AWMA/WI (NAAWS), unless noted otherwise.

## 2.10 FABRICATION

- A. Shop assemble work for delivery to site, permitting passage through building openings.
- B. Cap exposed plastic laminate finish edges with plastic trim.
- C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
- D. Use exterior grade permanent adhesives recommended by treated wood manufacturer for all shop fabrications and field assembly.
- E. Use stainless steel for all fasteners and anchors.
  - 1. Use epoxy anchors at masonry.
  - 2. Countersink and fill all fasteners at exposed surfaces.
- F. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

## 2.11 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. Apply wood filler in exposed nail and screw indentations.
- C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.
- D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
  - 1. Transparent:
    - a. System - 1, Lacquer, Nitrocellulose.
    - b. Stain: As selected by Architect.
    - c. Sheen: Flat.
  - 2. Opaque:
    - a. System - 1, Lacquer, Nitrocellulose.
    - b. Color: As selected by Architect.
    - c. Sheen: Flat.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

### 3.02 INSTALLATION

- A. Install custom fabrications in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.



- B. Set and secure materials and components in place, plumb and level.
- C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.03 SITE APPLIED WOOD TREATMENT

- A. Apply preservative treatment in accordance with manufacturer's instructions.
- B. Brush apply one coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.
- C. Allow preservative to dry prior to erecting members.

3.04 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
- B. Site Finishing: See Painting and Coating Section.

3.05 TOLERANCES

- A. Maximum Variation from True Position: 1/16 inch.
- B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06 2000

SECTION 06 4100  
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Where indicated on drawings for the following:
- B. Specially fabricated casework and cabinet units.
- C. Hardware.
- D. Factory finishing.
- E. Preparation for installing utilities.

1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
- C. Section 12 3600 - Countertops and as indicated on drawings.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition 2014, with Errata (2016).
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards 2021, with Errata.
- C. BHMA A156.9 - Cabinet Hardware 2020.
- D. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood 2020.
- E. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- F. UL (DIR) - Online Certifications Directory Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
  - 1. Provide information as required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
  - 2. Submit shop drawings for all Architectural Millwork and Solid Polyester Resin and/or Simulated Stone counters and worktops.

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ARCHITECTURAL WOOD CASEWORK

- C. Product Data: Provide data for hardware accessories.
- D. Samples: Submit actual samples of architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.
- E. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.
- F. Certificate: Submit labels and certificates required by quality assurance and quality control programs.
- G. Sustainable Design Submittal: Documentation for sustainably harvested wood-based components.

#### 1.06 QUALITY ASSURANCE

- A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
  - 1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
  - 2. Single Source Responsibility: Provide and install this work from single fabricator.
- B. Quality Certification:
  - 1. Replace, repair, or rework all work for which certification is refused.
  - 2. Architectural Woodwork Institute (AWI) custom grade. Conceal or countersink fasteners. Fasteners to be stainless steel.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect units from moisture damage.

#### 1.08 FIELD CONDITIONS

- A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Single Source Responsibility: Provide and install this work from single fabricator.

#### 2.02 CABINETS

- A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
- B. Conceal or countersink fasteners. Fasteners to be stainless steel.
- C. Cabinet doors and drawer fronts and Cubbies to be fabricated of solid Hard Maple species, AWI grading rules, Custom Grade.
- D. Cabinets at Kitchen 2xx:

1. Finish - Exposed Exterior Surfaces: Wood.
2. Finish - Exposed Interior Surfaces: Wood.
3. Finish - Semi-Exposed Surfaces: Wood
4. Casework Construction Type: Type A - Frameless.
5. Cabinet Design Series: As indicated on drawings.
6. Cabinet Style: Flush overlay.
7. Cabinet Doors and Drawer Fronts: Flush style.
8. Drawer Side Construction: Multiple-dovetailed.
9. Drawer Construction Technique: Dovetail joints.

#### 2.03 WOOD-BASED COMPONENTS

- A. Wood fabricated from old growth timber is not permitted.

#### 2.04 COUNTERTOPS

- A. Countertops: See Section 12 3600.

#### 2.05 ACCESSORIES

- A. Adhesive: Type recommended by fabricator to suit application.
- B. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.
- C. Concealed Joint Fasteners: Threaded steel.
- D. Adjustable Drawer Organization Systems: Drawer trays, dividers, and connectors.

#### 2.06 HARDWARE

- A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
- B. Metal Z-Shaped Wall Cabinet Support Clips: Paired, cleated, structural anchorage components applied to back of cabinets and walls for wall cabinet mounting.
- C. Adjustable Shelf Supports: Standard back-mounted system using surface mounted metal shelf standards and coordinated cantilevered shelf brackets, satin chrome finish, for nominal 1 inch spacing adjustments.
- D. Fixed Standard Shelf, Countertop, and Workstation Brackets:
  1. Material: Steel.
  2. Finish: Manufacturer's standard, factory-applied, textured powder coat.
  3. Products:
    - a. A&M Hardware, Inc; Standard Brackets: [www.aandmhardware.com/#sle](http://www.aandmhardware.com/#sle).
- E. Fixed Americans with Disabilities Act (ADA)-Compliant Vanity and Countertop Brackets:
  1. Material: Steel.
  2. Finish: Manufacturer's standard, factory-applied primer.
  3. Products:
    - a. A&M Hardware, Inc; ADA Vanity Brackets: [www.aandmhardware.com/#sle](http://www.aandmhardware.com/#sle).
    - b. Rakks/Rangine Corporation; ADA Compliant Rakks EHV Vanity Supports: [www.rakks.com/#sle](http://www.rakks.com/#sle).

- F. Drawer and Door Pulls: "U" shaped wire pull, steel with chrome finish, as indicated on drawings inch centers.
- G. Cabinet Catches and Latches:
- H. Drawer Slides:
  - 1. Type: Extension types as indicated.
  - 2. Static Load Capacity: Commercial grade.
  - 3. Mounting: Side mounted.
  - 4. Stops: Integral type.
  - 5. Features: Provide self closing/stay closed type.

## 2.07 SHOP TREATMENT OF WOOD MATERIALS

- A. Provide UL (DIR) listed and approved identification on fire retardant treated material.
- B. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

## 2.08 FABRICATION

- A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
- B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
- C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.
- D. Matching Wood Grain: Comply with requirements of quality standard for specified Grade and as follows:
- E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

## 2.09 SHOP FINISHING

- A. Sand work smooth and set exposed nails and screws.
- B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
- C. On items to receive transparent finishes, use wood filler matching or blending with surrounding surfaces and of types recommended for applied finishes.
- D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
  - 1. Transparent:
    - a. System - 1, Lacquer, Nitrocellulose.
    - b. Stain: As selected by Architect.
    - c. Sheen: Satin.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify adequacy of backing and support framing.
- B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

- A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

3.03 ADJUSTING

- A. Adjust installed work.
- B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

- A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION 06 4100

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## SECTION 07 1300 SHEET WATERPROOFING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Supply labor, materials, plant, tools and equipment to complete the Work as shown on the Drawings and as specified herein including, but not limited to the following:
  - 1. Coordination of elevator pit foundation walls and pit slab with concrete / pre-fab 24x24x24 sump.
  - 2. Primer & Self-Adhered SBS Modified Asphalt Waterproofing Membrane,
  - 3. Drain Board/Protection Board,
  - 4. Specified Backfill.
- B. Pre-applied over wet concrete prior to rebar and concrete placement composite sheet membrane.
- C. Self-adhered modified bituminous sheet membrane.
- D. Both pre-installed before pit slab and post-installed on pit walls modified bituminous sheet membrane.
- E. Performance requirements for complete system and coordination with concrete formwork and pours.
- F. Underslab HDPE reinforced sheet membrane.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Concrete substrate.
- B. Section 07 2100 - Thermal Insulation: Insulation used for protective cover.
- C. Section 07 6200 - Sheet Metal Flashing and Trim: Metal parapet, coping, and counterflashing.
- D. Section 22 1006 - Plumbing Piping Specialties: Roof drain and plumbing vent flashing flanges.

#### 1.03 ABBREVIATIONS

- A. CPE - Chlorinated Polyethylene.
- B. EPDM - Ethylene Propylene Diene Monomer.
- C. HDPE - High-Density Polyethylene.
- D. IIR - Isobutene-Isoprene Rubber.
- E. NRCA - National Roofing Contractors Association.
- F. PUMA - Polyurethane-Methacrylate.
- G. PVC - Polyvinyl Chloride.
- H. SBS - Styrene-Butadiene-Styrene.



I. TPO - Thermoplastic Polyolefin.

#### 1.04 REFERENCE STANDARDS

- A. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course 2018 (Reapproved 2022).
- B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension 2016 (Reapproved 2021).
- C. ASTM D570 - Standard Test Method for Water Absorption of Plastics 2022.
- D. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting 2018.
- E. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds 1998 (Reapproved 2017).
- F. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test) 2008, with Editorial Revision (2015).
- G. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection 2021.
- H. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness 2015 (Reapproved 2021).
- I. ASTM D4068 - Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane 2017 (Reapproved 2022).
- J. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers 2022.
- K. ASTM D4551 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Flexible Concealed Water-Containment Membrane 2022.
- L. ASTM D4632/D4632M - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles 2015a.
- M. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane 2015, with Editorial Revision (2022).
- N. ASTM D5295/D5295M - Standard Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems 2018.
- O. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes 2020.
- P. ASTM D6506/D6506M - Standard Specification for Asphalt Based Protection Board for Below-Grade Waterproofing 2001, with Editorial Revision (2018).
- Q. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022a, with Editorial Revision (2023).
- R. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover 2008a (Reapproved 2019).

- S. ASTM F2130 - Standard Test Method for Measuring Repellency, Retention, and Penetration of Liquid Pesticide Formulation Through Protective Clothing Materials 2011 (Reapproved 2018).
- T. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems 2014, with Editorial Revision (2017).
- U. NRCA (WM) - The NRCA Waterproofing Manual 2021.

#### 1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.
- C. Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Indicate special procedures.
- E. Manufacturer's qualification statement.
- F. Installer's qualification statement.
- G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
- H. Specimen Warranty.

#### 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

#### 1.07 FIELD CONDITIONS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

#### 1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Contractor to correct defective Work within period of five years after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to Owner.
- C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water and as indicated on drawings, except where such failures are the result of structural failures of building. Hairline cracking of concrete due to temperature change or shrinkage is not considered a structural failure.

## PART 2 PRODUCTS

### 2.01 SHEET WATERPROOFING APPLICATIONS

- A. Self-Adhered Modified Bituminous Sheet Membrane:
  - 1. Location: elevator pit walls.
- B. Self-Adhered HDPE Sheet Membrane:
  - 1. Location: as needed per basis of design.
- C. Underslab HDPE Reinforced Sheet Membrane:
  - 1. Location: under elevator pit slab including under and around sump.
- D. Blindside HDPE Reinforced Sheet Membrane:
  - 1. Location: at elevator pit wall against existing foundation.
  - 2. Cover with drainage panel.
- E. Modified Bituminous Sheet Membrane:
  - 1. Location: as required by basis of design.
  - 2. Vertical Surfaces: Adhesive bonded to substrate.
  - 3. Horizontal Surfaces: Adhesive bonded to substrate.
  - 4. Cover with protection board.

### 2.02 SHEET WATERPROOFING MATERIALS

- A. WATERPROOFING MEMBRANE complete system for entire elevator pit Basis-of-Design:
  - 1. Blueskin ® WP200 manufactured by Henry
- B. Performance requirements: total and complete system with all need component and field modification for field conditions for excavation within an existing building for a new elevator pit.
- C. Strictly follow basis of design requirements and guidelines to meet the proceeding.
- D. Primary sheet applied self-adhered waterproofing membrane shall be Blueskin® WP200 manufactured by Henry, 1.5mm (60 mils) SBS modified bitumen, self-adhering sheet membrane with a cross-laminated polyethylene film, and having the following physical properties:
  - 1. Thickness: 1.5 mm (60 mils) min.,
  - 2. Flexibility: Pass @ -40 degrees C to ASTM D1970,
  - 3. Vapour permeance: 2.8 ng/Pa.s.m<sup>2</sup> ( 0.05 perms) to ASTM E96,
  - 4. Tensile strength (membrane): 2.24 MPa to ASTM D412,
  - 5. Tensile strength (film): 34.5 MPa to ASTM D882,
  - 6. Elongation: 300% to ASTM D412,
  - 7. Puncture resistance: 222 N min. to ASTM E154.
- E. Primer for self-adhering membranes at temperatures above 25 degrees F shall be Aquatacä Primer manufactured by Henry, a polymer emulsion based adhesive, quick setting, having the following physical properties:
  - 1. Colour: Aqua;
  - 2. Weight: 8.7 lbs/gal;
  - 3. Solids by weight: 53%;
  - 4. Water based, no solvent odours
  - 5. Drying time (initial set): 30 minutes at 50% RH and 70 degrees F

- F. LIQUID MEMBRANE & TERMINATION SEALANT
1. Termination Sealant shall be HE925 BES Sealant manufactured by Henry; a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:
  2. Compatible with sheet air barrier, roofing and waterproofing membranes and substrate,
  3. Complies with Fed. Spec. TT-S-00230C, Type II, Class A
  4. Complies with ASTM C 920, Type S, Grade NS, Class 25
  5. Elongation: 450 – 550%
  6. Remains flexible with aging
  7. Seals construction joints up to 1 inch wide
- G. PREFABRICATED DRAIN BOARDS: Two part prefabricated geocomposite drain board consisting of a formed polystyrene or PVC core covered on one side with a woven or non-woven polypropylene filter fabric:
1. Henry DB 200: For vertical and horizontal installations, shallower depths.
  2. Henry DB 500: For vertical installations requiring high compressive strength and high flow capacity.
  3. Henry DB 650: For horizontal applications requiring high compressive strength, high flow capacity & woven geotextile. Suitable for use under topping slab in split slab applications.
- H. PREFABRICATED DRAIN BOARD ACCESSORIES:
1. Securement Bars: Continuous 1/4 inch x 3/4 inch HDPE bar for screw attachment.
  2. Moulding Strip: Continuous 3 1/2 inch wide 'Z' flashing strip to fit over exposed top edge of drain board.
  3. Drain Board Plugs & Nails: HDPE pre-moulded washer to fit dimples c/w high strength, corrosion resistant concrete nails, UCAN AFH 37 or equal.
- I. Pre-Applied Over Wet Concrete Prior to Rebar and Concrete Placement Composite Sheet Membrane:
1. Thickness: 32 mil, 0.032 inch, nominal.
  2. Sheet Width: 39-3/8 inches, minimum.
  3. Sheet Length: 65.6 feet, minimum.
  4. Tensile Strength: 2,400 psi, minimum, measured in accordance with ASTM D412.
  5. Elongation: 800 percent, minimum, measured in accordance with ASTM D412.
  6. Water Vapor Permeance: 0.01 perm, maximum, measured in accordance with ASTM E96/E96M, Method B.
  7. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F.
  8. Peel Adhesion to Concrete: 5 lb/inch, minimum, when tested in accordance with ASTM D903.
  9. Lap Peel Adhesion: 6.9 lb/inch, minimum, when tested in accordance with ASTM D1876.
  10. Puncture Resistance: 110 lb, minimum, measured in accordance with ASTM E154/E154M.
  11. Water Absorption: 0.4 percent increase in weight, maximum, measured in accordance with ASTM D570, 24-hour immersion.
  12. Hydrostatic Pressure Resistance: Membrane resists leakage for at least one hour from pressure equivalent to 231 feet head of water applied in accordance with test method ASTM D5385/D5385M.
  13. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
  14. Products:
    - a. Henry Company; Blueskin @ WP200: [www.henry.com/#sle](http://www.henry.com/#sle).
    - b. And the following as required by field conditions:
    - c. Henry Company; Blueskin PreSeal 320: [www.henry.com/#sle](http://www.henry.com/#sle).

- d. Henry Company; Blueskin PreSeal 435: [www.henry.com/#sle](http://www.henry.com/#sle).
- J. Self-Adhered Modified Bituminous Sheet Membrane:
1. Thickness: 60 mil, 0.060 inch, minimum.
  2. Sheet Width: 36 inches, minimum.
  3. Tensile Strength:
    - a. Film: 5,000 psi, minimum, measured in accordance with ASTM D882 and at grip-separation rate of 2 inches per minute.
    - b. Membrane: 325 psi, minimum, measured in accordance with ASTM D412 Method A, using die C and at spindle-separation rate of 2 inches per minute.
  4. Elongation at Break: 300 percent, minimum, measured in accordance with ASTM D412.
  5. Water Vapor Permeance: 0.05 perm, maximum, measured in accordance with ASTM E96/E96M.
  6. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F, 180 degree bend on 1 inch mandrel.
  7. Adhesion: 150 psi, minimum, measured in accordance with ASTM D4541.
  8. Water Absorption: 0.1 percent increase in weight, maximum, measured in accordance with ASTM D570, 24 hour immersion.
  9. Hydrostatic Pressure Resistance: Membrane resists leakage for at least one hour from pressure equivalent to 200 feet head of water applied in accordance with test method ASTM D5385/D5385M.
  10. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
  11. Products:
    - a. Henry Company; Blueskin WP 200: [www.henry.com/#sle](http://www.henry.com/#sle).
- K. Self-Adhered HDPE Sheet Membrane: Recommended by manufacturer for placement below concrete slabs and on outside face of below grade walls before placement of concrete.
1. Sheet Thickness: 32 mil, 0.032 inch, minimum.
  2. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F, 180 degree bend on 1 inch mandrel.
  3. Hydrostatic Pressure Resistance: Membrane resists leakage for at least one hour from pressure equivalent to 231 feet head of water applied in accordance with test method ASTM D5385/D5385M.
  4. Elongation at Break: 500 percent, minimum, measured in accordance with ASTM D412.
  5. Tensile Strength, Film: 3,500 psi, minimum, measured in accordance with ASTM D412.
  6. Adhesion: 150 psi, minimum, measured in accordance with ASTM D4541.
  7. Water Vapor Permeance: 0.01 perm, maximum, measured in accordance with ASTM E96/E96M.
  8. Lateral Water Migration Resistance: Resists pressure of 231 ft head of water, when tested in accordance with ASTM D5385/D5385M.
  9. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
  10. Products:
    - a. As per basis of design.
- L. Underslab HDPE Sheet Membrane and Insect Barrier: Recommended by manufacturer for placement below concrete slabs before placement of concrete, with 4 inch wide self-adhered overlap seam along one edge.
1. Sheet Thickness: 95 mil, 0.095 inch, minimum.
  2. Sheet Width: 50 inches, minimum.
  3. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
  4. Low Temperature Flexibility: Unaffected when tested in accordance with ASTM D1970/D1970M at minus 20 degrees F, 180 degree bend on 1 inch mandrel.

5. Hydrostatic Pressure Resistance: Membrane resists leakage for at least one hour from pressure equivalent to 231 feet head of water applied in accordance with test method ASTM D5385/D5385M.
  6. Elongation at Break: Greater than 1,000 percent, measured in accordance with ASTM D412.
  7. Tensile Strength, Geotextile Layer: 80 pounds, minimum at 1 inch wide, measured in accordance with ASTM D4632/D4632M.
  8. Adhesion: 150 psi, minimum, measured in accordance with ASTM D4541.
  9. Water Vapor Permeance: 0.01 perm, maximum, measured in accordance with ASTM E96/E96M.
  10. Lateral Water Migration Resistance: Resists the weight of 231 feet when tested in accordance with ASTM D5385/D5385M.
  11. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
  12. Products:
    - a. As per basis of design.
- M. Underslab HDPE Reinforced Sheet Membrane: Sheet membrane with cross-laminated, high-density HDPE backing laminated to waterproofing adhesive compound integrated into nonwoven geotextile fabric.
1. Application: Install horizontally over prepared sub bases with concrete slab on grade.
  2. Sheet Thickness: 85 mil, 0.085 inch, minimum.
  3. Puncture Resistance: 217 lb, minimum, in accordance with ASTM E154/E154M.
  4. Adhesion: 150 psi, minimum, measured in accordance with ASTM D4541.
  5. Products:
    - a. As per basis of design.
- N. Blindside HDPE Reinforced Sheet Membrane: Sheet membrane with cross-laminated, high-density HDPE backing laminated to waterproofing adhesive compound integrated into nonwoven geotextile fabric.
1. Application: Install vertically, over sheet steel piling substrate with composite drainage system, in accordance with project requirements.
  2. Sheet Thickness: 73 mil, 0.073 inch, minimum.
  3. Puncture Resistance: 217 lb, minimum, in accordance with ASTM E154/E154M.
  4. Adhesion: 150 psi, minimum, measured in accordance with ASTM D4541.
  5. Products:
- O. Modified Bituminous Sheet Membrane: Asphalt and polymer modifiers of SBS type, reinforced with nonwoven glass fibers; smooth surfaced.
1. Formulated for seaming by heat welding.
  2. Thickness: 100 mil, 0.10 inch, minimum.
  3. Sheet Width: 19-11/16 inches, minimum.

## 2.03 ACCESSORIES

- A. Attachment Materials:
1. Battens: As per basis of design.
  2. Disc Washers and Screws: As per basis of design.
  3. Circular Membrane Discs: As per basis of design.
  4. Reglet Strip Devices: As per basis of design.
- B. Seaming Materials: As recommended by membrane manufacturer.
- C. Membrane Sealant: As recommended by membrane manufacturer.

- D. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.
- E. Temporary Wood Protection Waterproofing Sheet: Self-adhered moisture protection for wood components during construction phase.
  - 1. Composition: Flexible nonwoven polypropylene (PO) with antislip layer and acrylic-based adhesive.
  - 2. Thickness: 20 mil, 0.020 inch thick.
  - 3. Width: As required for application.
  - 4. Water Vapor Permeability: 0.5 perm, measured in accordance with ASTM E96/E96M.
  - 5. Products:
    - a. As per basis of design.
- F. Protection Board: Provide type capable of preventing damage to waterproofing due to backfilling and construction traffic.
  - 1. Hardboard, 1/8 inch thick.
  - 2. Asphalt impregnated wood fiberboard, 1/4 inch thick.
  - 3. Polystyrene foam board, 1 inch thick.
  - 4. Multilayer internally-reinforced asphaltic panels, 1/8 inch thick, nominal, complying with ASTM D6506/D6506M.
  - 5. Recycled or reclaimed closed-cell foam plastic with nonwoven filter fabric cover; 1 inch thick.
  - 6. Semi-rigid glass fiber board; unaffected by water, freeze-thaw, fungus, or soil bacteria; containing no formaldehyde, phenol, acrylic, or artificial color; 3/4 inch thick, nominal.
  - 7. Products:
    - a. As per basis of design.
- G. Drainage Panel: Drainage layer with geotextile filter fabric on earth side.
  - 1. Composition: Dimpled polystyrene, polyethylene, or polypropylene core; polypropylene filter fabric.
  - 2. Thickness: As indicated on drawings.
  - 3. Products:
    - a. As per basis of design.
- H. Preformed Flashing Shapes: Injected or vacuum molded one piece shapes used for detailing of inside and outside corners, protrusions, and transitions.
  - 1. Color: Black.
  - 2. Products:
    - a. As per basis of design.
- I. Flexible Flashings: Type recommended by membrane manufacturer.
- J. Adhesives: As recommended by membrane manufacturer.
- K. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting work.

- B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.
- C. Verify that items penetrating surfaces to receive waterproofing are securely installed.
- D. Where existing conditions are responsibility of another installer, notify Architect of unsatisfactory conditions.
- E. Do not proceed with work until unsatisfactory conditions have been corrected.

### 3.02 PREPARATION

- A. All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar, frost or other contaminants. Fill spalled areas in substrate to provide an even plane.
- B. New concrete should be cured for a minimum of 7 days and must be dry before waterproofing membranes are applied. Lightweight structural concrete must be cured a minimum of 14 days.
- C. Use appropriate waterproofing membrane primer as recommended by manufacturer based on air and surface temperature at time of application.
- D. Protect adjacent surfaces from damage not designated to receive waterproofing.
- E. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions; vacuum substrate clean.
- F. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.
- G. Fill nonmoving joints and cracks with a filler compatible with waterproofing materials.
- H. Seal moving cracks with sealant and nonrigid filler, using procedures recommended by sealant and waterproofing manufacturers.
- I. Prepare building expansion joints at locations as indicated on drawings.
- J. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.
- K. Primer
  - 1. Apply primer for self-adhered membrane by roller or spray at rate recommended by manufacturer.
  - 2. Allow minimum 30 minute open time. Primed surfaces not covered by waterproofing membrane during the same working day must be re-primed.
- L. Concrete Surfaces for Adhesive Bonding: Prepare concrete substrate in accordance with ASTM D5295/D5295M.
  - 1. Remove substances that inhibit adhesion including form release agents, curing compounds admixtures, laitance, moisture, dust, dirt, grease and oil.
  - 2. Repair surface defects including honeycombs, fins, tie holes, bug holes, sharp offsets, rutted cracks, ragged corners, deviations in surface plane, spalling and delaminations, as described in reference standard.
  - 3. Remove and replace areas of defective concrete; see Section 03 3000.
  - 4. Prepare concrete for adhesive bonded waterproofing using mechanical or chemical methods described in referenced standard.
  - 5. Test concrete surfaces as described in referenced standards, and verify surfaces are ready to receive adhesive bonded waterproofing membrane system.



### 3.03 INSTALLATION - MEMBRANE

- A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.
- B. Roll out membrane, and minimize wrinkles and bubbles.
- C. Self-Adhering Membrane: Remove release paper layer, and roll out onto substrate with a mechanical roller to provide full contact bond.
- D. Adhesive Bonded Membrane: Apply adhesive in accordance with manufacturer's instructions, and bond sheet to substrate except in those areas directly over or within 3 inches of a control or expansion joint.
- E. Overlap edges and ends, minimum 3 inches, seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.
- F. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.
- G. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.
- H. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.
- I. Seal membrane and flashings to adjoining surfaces.

### 3.04 INSTALLATION - DRAINAGE PANEL and PROTECTION BOARD

- A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward; scribe and cut boards around projections, penetrations, and interruptions.
- B. Place protection board directly against drainage panel; butt joints, and scribe and cut boards around projections, penetrations, and interruptions.
- C. Adhere protection board to substrate with compatible adhesive.

### 3.05 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Owner will provide testing services, and Contractor to provide temporary construction and materials for testing.
- C. Upon completion of horizontal membrane installation, dam installation area in preparation for flood testing.
  - 1. Flood to minimum depth of 1 inch with clean water, and after 48 hours inspect for leaks.
  - 2. If leaking is found, remove water, repair leaking areas with new waterproofing materials as directed by Architect; repeat flood test, and repair damage to building.
  - 3. When area is proven watertight, drain water and remove dam.

### 3.06 PROTECTION

- A. Do not permit traffic over unprotected or uncovered membrane.

3.07 SCHEDULE

- A. Under Concrete Elevator Pit Slab and Sump
- B. Between New Concrete Elevator Pit and Existing Foundation
- C. On Concrete Elevator Pit Walls

END OF SECTION 07 1300

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## SECTION 07 1600 WATERPROOF CEMENT-BASED COATING

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. Section Includes:
  - 1. Application of polymer modified cement waterproofing.
  - 2. Waterproofing below grade interior surface of basement and foundation walls as scheduled.
  - 3. Flashing of rough opening concrete or masonry openings.
- B. Related Sections:
  - 1. Section 03 30 00 – Cast-in-Place Concrete.
  - 2. Section 04 20 00 - Unit Masonry
- C. Provide 10 SF each at two TBD locations in Basement and provide Unit Price for additional scope as needed and determined during construction. Defer to drawings for additional defined scoped.

#### 1.02 SUBMITTALS

- A. Comply with Section 01 33 00.
- B. Product Data: Submit manufacturer's technical bulletins and SDS on each product.
- C. Submit list of project references as documented in this specification under Quality Assurance Article. Include contact name and phone number of the person charged with oversight of each project.
- D. Quality Control Submittals:
  - 1. Provide protection plan of surrounding areas and non-work surfaces.

#### 1.03 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Manufacturer Qualifications: Company with minimum 15 years of experience in manufacturing of specified products and systems.
  - 2. Manufacturer Qualifications: Company shall be ISO 9001:2015 Certified.
  - 3. Applicator Qualifications: Company with minimum of 5 years' experience in application of specified products and systems on projects of similar size and scope, and is acceptable to product manufacturer.
    - a. Successful completion of a minimum of 5 projects of similar size and complexity to specified Work.

#### 1.04 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

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WATERPROOF CEMENT-BASED COATING

- C. Transport and store in unopened containers and keep in clean, dry condition protected from rain, dew and humidity. If dry onsite storage of bags is unavailable or if project is located in a very wet, humid climate, purchase product in manufacturer's packaged metal pails.
- D. Do not stack bags more than two pallets high.
- E. Do not allow MasterEmaco® A660 modifying admixture (formerly Acryl 60) to freeze.

#### 1.05 PROJECT CONDITIONS

- A. Environmental Requirements:
  - 1. Do not apply in rain or when rain is expected within 24 hours. Do not apply above 90 degrees F (32 degrees C) or below 40 degrees F (4 degrees C) or when temperatures are expected to fall below 40 degrees F (4 degrees C) within 24 hours. For hot and cold temperature applications, store materials and water at 50 degrees F (10 degrees C) to 70 degrees F (21 degrees C) before use.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Subject to compliance with requirements, provide products from the following manufacturer:
  - a. Master Builders Solutions
  - b. 889 Valley Park Drive
  - c. Shakopee, MN 55379 USA
  - d. Customer Service: 800-433-9517
  - e. Technical Service: 800-243-6739
  - f. Direct Phone: 952-496-6000
  - g. Website: [www.master-builders-solutions.com/en-us](http://www.master-builders-solutions.com/en-us)
- B. Specifications and drawings are based on manufacturer's proprietary literature from Master Builders Solutions. Other manufacturers shall comply with minimum levels of material, color selection, and detailing indicated in specifications or on drawings. Architect will be sole judge of appropriateness of substitutions.

#### 2.02 MATERIALS

- A. A portland-cement based coating for concrete and masonry that resists both positive and negative hydrostatic pressure and is breathable, allowing interior moisture to escape without damaging coating.
  - 1. Acceptable Product:
    - a. Standard Coating: MasterSeal 581 by Master Builders Solutions.
    - b. Plaster Mix: MasterSeal 584 by Master Builders Solutions.
    - c. Foundation Coating: MasterSeal 582 by Master Builders Solutions.
    - d. Waterstop: MasterSeal 590 by Master Builders Solutions.
    - e. Polymer Modifier: MasterEmaco A 660 by Master Builders Solutions.
- B. Performance Requirements: Provide patching material complying with the following requirements:
  - 1. Compliances
    - a. NSF/ANSI Standard 61 for potable water contact.
  - 2. Service temperatures: Immersion, up to 140 degrees F (60 degrees C); cleaning water, up to 200 degrees F (93 degrees C); dry air, up to 220 degrees F (104 degrees C).

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WATERPROOF CEMENT-BASED COATING

3. VOC: 0 lbs/gal (0 g/L) less water and exempt solvents.
4. Initial Set, minutes at 70 degrees F (21 degrees C), 50 percent relative humidity: 10 minutes per lab method.
5. Final Set, minutes at 70 degrees F (21 degrees C), 50 percent relative humidity: 90 minutes per lab method.
6. Density (cured): 129 pounds per foot (2,080 kg/m) per lab method.
7. Positive resistance to hydrostatic pressure, hrs, at 200 psi (1.4 MPa), 461 head feet, air cured at 70 degrees F (21 degrees C) 50 percent relative humidity: 752 (No leakage, no softening) per CRD C 48, modified.
8. Negative resistance to hydrostatic pressure, hours, at 200 psi (1.4 MPa), 461 head feet, air cured at 70 degrees F (21 degrees C) 50 percent relative humidity: 664 (Limited dampness) per CRD C 48, modified.
9. Potable water (direct contact): Suitable approved per BS6920 (British standard), NSF Standard 61.
10. Water absorption, boiling water submersion at 24 hours: 3.6 percent per ASTM C 67 (Section 7.3).
11. Compressive strength, ASTM C 109:
  - a. 7 days: 4,200 psi (29 MPa)
  - b. 28 days: 6,030 psi (42 MPa)
12. Flexural strength, ASTM C 348:
  - a. 7 days: 360 psi (2.5 MPa)
  - b. 28 days: 1,027 psi (7 MPa)
13. Tensile strength, ASTM C 190:
  - a. 7 days: 250 psi (2 MPa).
  - b. 28 days: 440 psi (3 MPa).
14. Modulus of elasticity, ASTM C 469, 28 days:  $2.72 \times 10$  to the 6th psi ( $1.87 \times 10$  to the 4th MPa).
15. Artificial weathering, hrs:
  - a. Xenon Arc: 5,000 = No failure per ASTM G 26.
  - b. Carbon Arc: 500 = No failure per ASTM G 23.
16. Adhesion strength, Test by tensile bond: 418 psi (2.9 MPa).
17. Artificial weathering, Atlas Type DMC weatherometer: No cracking, loss of adhesion, checking or other defect.
18. Freeze/thaw resistance, 200 cycles: No change per ASTM C 666 (Procedure B).
19. Salt spray resistance, 300 hours: No defect per ASTM B 117.
20. Carbon Dioxide (CO<sub>2</sub>), 1/16 inch (1.6 mm) per Lab Method Diffusion. Equivalent to 3/4 inch (19 mm) new concrete.
21. Permeance:
  - a. Perms: 12 (0.10698) per ASTM E 96
  - b. Metric permeability  $18 \times 10$  to the 3rd resistance (water-vapor transmission) per Swedish standard SS-02-15-82.
22. Wind-driven rain, hrs: 8 = excellent per Fed. Spec. TT-P-0035 (Para 4.4.7).
23. Coefficient of thermal expansion in/in/degree F (mm/mm/degree C), at 28 days:  $6.99 \times 10$  to the minus 6th ( $5 \times 10$  to the minus 7th) per ASTM C 531.
24. Impact strength (Gardener impact tester): No chipping per Fed. Spec. TT-P-0035 (Cement paints para. 3.4.8)
25. Hardness, (Barber Coleman Impressor) Requirement min = 30, max = 60 (para 4.4.9) Fed. Spec. TT-P-0035:
  - a. 7 days: 35.
  - b. 14 days: 47.
  - c. 21 days: 52.
26. Abrasion resistance 3,000 L sand: Passed per Fed. Spec. TT-P-141B.
27. Reflectance ASTM D 2244 using Hunterlab D-25 meter:

- a. Gray MASTERSEAL 581: 64.2.
- b. White MASTERSEAL 581: 88.1.
- 28. Fungus resistance at 21 days: No growth; meets all requirements of Fed. Spec. TT-P-29B.
- 29. Surface burning characteristics per ASTM E 84:
  - a. Flame Spread: 0.
  - b. Smoke developed: 5.
- 30. Fire Propagation Flame spread: Index = 1.5, Class 1 per BS476: Part 6:1981, BS476: Part 7:1971.

### 2.03 Mixing

- A. Mix material per manufacturer instructions allowing material to rest 10 minutes before remixing and application.
- B. Color:
  - 1. White.
  - 2. Standard Gray.
  - 3. Custom and landscape color. Refer to Drawings.

## PART 3 EXECUTION

### 3.01 EXAMINATION

### 3.02 SURFACE PREPARATION

- A. Ensure that substrates are sound and free of dust, dirt, laitance, paints, oils, grease, curing compounds and other contaminants.
- B. Ensure substrate has properly cured. Concrete should obtain 80 percent of design strength. If efflorescence is present, mechanically remove it before proceeding. For extreme cases where this is not adequate, contact Technical Service.
- C. Patch holes and cracks before installation.
- D. Relieve hydrostatic pressure in concrete block with weep holes.
- E. Roughen or brush blast extremely smooth surfaces to ensure good mechanical adhesion.

### 3.03 Application - GENERAL

- A. Apply coating with manufacturer recommended brush or broom or equivalent stiff fiber brush or with textured spray equipment. Spray, back-brush, or broom applications of first coat to fill voids and achieve uniformity.
- B. Completely dampen substrate with water before starting application. Do not saturate substrate. Keep substrate cool and damp throughout application.
- C. Work first coat thoroughly into substrate to completely fill and cover voids, holes and nonmoving cracks.
- D. Allow to cure 24 hours, then apply second coat and finish with vertical stroke.

- E. On concrete block or masonry walls, allow 5 to 7 days before applying second coat to eliminate joint read through.
- F. Allow coating to cure 7 to 10 days before immersion in water.

#### PART 4 EXECUTION CONTINUED

##### 4.01 below grade interior application

- A. Typical Application:
  - 1. Total: 3 pounds per square yard (1.6 kg/sm), cured nominal thickness of 1/16 inch (1.6 mm).
- B. Application at High Hydrostatic Conditions: Refer to Drawings
  - 1. Spray and back-brush coat of standard coating at 4 pounds per square yard (2.2 kg/sm) waterproofing from positive side if possible.

##### 4.02 CLEANING

- A. Clean waterproofing material from tools and equipment with water. Remove cured materials mechanically.
- B. Clean up and properly dispose of debris remaining on Project site related to application.
- C. Remove temporary coverings and protection from adjacent Work areas.

##### 4.03 PROTECTION

- A. Protect system from damage during construction.

END OF SECTION 07 1600



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## SECTION 07 2100 THERMAL INSULATION

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Batt insulation for interior walls between stud framing in walls and where otherwise indicated as acoustical insulation on drawings.
- B. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.
- C. Roof Insulation below and above deck and other insulation as shown on drawings.

#### 1.02 RELATED REQUIREMENTS

- A. Section 06 1000-Rough Carpentry: Installation requirements for board insulation.
- B. Section 08 1113 - HOLLOW METAL DOORS AND FRAMES for interior wall.

#### 1.03 REFERENCE STANDARDS

- A. ASTM C240 - Standard Test Methods for Testing Cellular Glass Insulation Block 2021.
- B. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method 2022.
- C. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation 2022.
- D. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications 2013 (Reapproved 2019).
- E. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation 2022.
- F. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation 2014 (Reapproved 2019).
- G. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.
- H. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board 2022a.
- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
- J. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials 2022a, with Editorial Revision (2023).
- K. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C 2022.
- L. ASTM E1414/E1414M - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum 2021a.

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THERMAL INSULATION

- M. ASTM E2357 - Standard Test Method for Determining Air Leakage Rate of Air Barrier Assemblies 2018.
- N. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components 2023.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

#### 1.05 QUALITY ASSURANCE

- A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); [www.airbarrier.org/#sle](http://www.airbarrier.org/#sle):

#### 1.06 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

### PART 2 PRODUCTS

#### 2.01 APPLICATIONS

- A. Insulation in Wood and Metal Framed Walls: Sound attenuation Batt insulation with no vapor retarder.
- B. Miscellaneous Insulation indicated on drawings.

#### 2.02 FIBERBOARD INSULATION MATERIALS

- A. Where fiberboard insulation is indicated, either rock, slag, or glass mineral fiberboard insulation may be used, at Contractor's option.
- B. Mineral Fiberboard Insulation: Rigid mineral fiber, in accordance with ASTM C612.
  - 1. Facing: None, unfaced.
  - 2. Flame Spread Index: 25 or less, when tested with facing, if any, in accordance with ASTM E84.
  - 3. Smoke Developed Index: 50 or less, when tested with facing, if any, in accordance with ASTM E84.
  - 4. Board Size: 48 by 48 inch.
  - 5. Board Thickness: 1 inch.
- C. Mineral Fiberboard Insulation: Rigid or semi-rigid mineral fiber, ASTM C612 or ASTM C553; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
  - 1. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.

## 2.03 BATT INSULATION MATERIALS

- A. Where batt insulation is indicated, either glass fiber or mineral fiber batt insulation may be used, at Contractor's option.
- B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
  - 1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
  - 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
  - 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
  - 4. Formaldehyde Content: Zero.
  - 5. Thermal Resistance: R-value of R3 per inch.
  - 6. Facing: Aluminum foil, flame spread 25 rated; one side.
  - 7. Products:
    - a. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
    - b. Johns Manville: [www.jm.com/#sle](http://www.jm.com/#sle).
    - c. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: [www.ocbuildingspec.com/#sle](http://www.ocbuildingspec.com/#sle).
- C. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665; friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.
  - 1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
  - 2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
  - 3. Provide foil facing on one side, at locations indicated on drawings.
  - 4. Thermal Resistance: R-value of R3 per inch.
  - 5. Products:
    - a. Johns Manville; MinWool Sound Attenuation Fire Batts: [www.jm.com/#sle](http://www.jm.com/#sle).
    - b. Knauf Insulation; EcoBatt Insulation: [www.knaufinsulation.com/#sle](http://www.knaufinsulation.com/#sle).
    - c. ROCKWOOL (ROXUL, Inc); COMFORTBATT: [www.rockwool.com/#sle](http://www.rockwool.com/#sle).
    - d. ROCKWOOL (ROXUL, Inc); AFB: [www.rockwool.com/#sle](http://www.rockwool.com/#sle).
    - e. ROCKWOOL (ROXUL, Inc); AFB evo™: [www.rockwool.com/#sle](http://www.rockwool.com/#sle).
    - f. Thermafiber, Inc; SAFB: [www.thermafiber.com/#sle](http://www.thermafiber.com/#sle).
    - g. Thermafiber, Inc; SAFB FF: [www.thermafiber.com/#sle](http://www.thermafiber.com/#sle).

## 2.04 ACCESSORIES

- A. Interior Vapor Retarder: Modified polyethylene/polyacrylate (PE/PA) film reinforced with polyethylene terephthalate (PET) fibers, 12 mils, 0.012 inch thick.
- B. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
  - 1. Application: Sealing of interior circular penetrations, such as pipes or cables.
  - 2. Width: Are required for application.
  - 3. Temperature Resistance: Minus 40 degrees F to 212 degrees F
- C. Flashing Tape: Special reinforced film with high performance adhesive.
  - 1. Application: Window and door opening flashing tape.
  - 2. Width: As required for application.
  - 3. Primer: Tape manufacturer's recommended product.
- D. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate,

capable of securely and rigidly fastening insulation in place.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

#### 3.02 BOARD INSTALLATION OVER LOW SLOPE ROOF DECK

- A. Board Installation Over Roof Deck, General:
  - 1. See applicable roofing specification section for specific board installation requirements.
  - 2. Ensure vapor retarder is clean and dry, continuous, and ready for application of roofing system.
  - 3. Fasten insulation to deck in accordance with roofing manufacturer's written instructions and applicable Factory Mutual requirements.
  - 4. Do not apply more insulation than can be covered with roofing on the same day.

#### 3.03 BATT INSTALLATION

- A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
- B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Install with factory-applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.
- F. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- G. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches on center. Lap and seal sheet retarder joints over face of member.
- H. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over face of member
- I. Tape seal tears or cuts in vapor retarder.

#### 3.04 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Coordination of Air Barrier Association of America (ABAA) Tests and Inspections:
  - 1. Provide testing and inspection required by ABAA Quality Assurance Program (QAP).
  - 2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
  - 3. Cooperate with ABAA testing agency.

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THERMAL INSULATION

4. Allow access to air barrier work areas and staging.
5. Do not cover air barrier work until tested, inspected, and accepted.

3.05 Schedule

- A. Thermal Insulation shall conform to the following minimum standard: IECC 2015 (adopted by Philadelphia as of October 2018) OR greater as indicated on drawings; exceptions per IEBC:
  1. ALL Insulation panel joints to be sealed; air sealing required.

3.06 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 2100

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## SECTION 07 2126 BLOWN INSULATION

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Exterior Walls: Blown insulation pneumatically placed into wall spaces through access holes as there is an existing opening to interior space prior to wall patching.
- B. Ceiling and Attic: Blown insulation pneumatically placed into joist spaces through access holes where batt insulation can not be installed correctly.

#### 1.02 REFERENCE STANDARDS

- A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. ASTM C739 - Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation 2021a.
- C. ASTM C764 - Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation 2019.
- D. ASTM C1015 - Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation 2017.

#### 1.03 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and limitations.
- C. Certificates: Certify that products of this section meet or exceed specified requirements.
- D. Manufacturer's Installation Instructions: Indicate procedure for preparation and installation.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Blown Insulation:
  - 1. CertainTeed Corporation: [www.certainteed.com/#sle](http://www.certainteed.com/#sle).
  - 2. GreenFiber: [www.greenfiber.com/#sle](http://www.greenfiber.com/#sle).
  - 3. Johns Manville: [www.jm.com/#sle](http://www.jm.com/#sle).
  - 4. Thermafiber, Inc: [www.thermafiber.com/#sle](http://www.thermafiber.com/#sle).

#### 2.02 MATERIALS

- A. Applications: Provide blown insulation in attic, exterior walls, and ceiling as indicated on drawings and where not possible to install batt / board insulation.
- B. Provide blown insulation in accordance with requirements of Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

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BLOWN INSULATION



- C. Blown Insulation: ASTM C764, fiberglass type, nodulated for pour and bulk for pneumatic placement.
  - 1. Thermal Transmittance (U-value): 0.27 BTU/hr sq ft deg F, maximum.
  - 2. Thermal Resistance (R-value): 11.0 sq ft hr deg F/BTU inch, minimum.

#### 2.03 Accessories

- A. Roof Ventilation Baffles: Prefabricated ventilation channels for placement under roof sheathing with baffles to prevent wind-washing.
  - 1. Material: Polyvinyl chloride (PVC).
  - 2. Roof Joist/Truss Spacing: 16 inch on center, nominal.
  - 3. Manufacturers:
    - a. Brentwood Industries, Inc; AccuVent Original: [www.brentwoodindustries.com/#sle](http://www.brentwoodindustries.com/#sle).

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that substrate and adjacent materials are dry and ready to receive insulation.
- B. Verify that light fixtures have thermal cut-out device to restrict over-heating in soffit or ceiling spaces.
- C. Verify spaces are unobstructed to allow for proper placement of insulation.

#### 3.02 INSTALLATION

- A. Install insulation and ventilation baffle in accordance with ASTM C1015 and manufacturer's instructions.
- B. Drill 2 inch diameter insulation access ports in fascia boards to permit equipment access.
- C. Place insulation pneumatically to completely fill stud, joist, and rafter spaces.
- D. Pour insulation to completely fill stud, joist, and rafter spaces.
- E. Place insulation against baffles, and do not impede natural attic ventilation to soffit.
- F. Place against and behind mechanical and electrical services within the plane of insulation.
- G. Completely fill intended spaces leaving no gaps or voids.
- H. Repair and reseal insulation access ports, and refinish to match adjacent work.

#### 3.03 CLEANING

- A. Remove loose insulation residue.

#### 3.04 SCHEDULES

- A. Existing Exterior Walls: Pneumatically placed into wall stud spaces through open holes at exterior wall boards.

B. Attic Spaces: Pour insulation between ceiling joists to achieve an R-value of 19.  
END OF SECTION 07 2126

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SECTION 07 8410  
FIRE STOPPING AND SMOKE STOPPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Applicable provisions of Contract Requirements in Division 0 and all applicable Division 1 sections including all LEED requirements and submittals.

1.02 SECTION INCLUDES:

- A. Furnish and Install: Fire stopping, smoke stopping, and identification labels.
  - 1. Renovation Work: Work of this Section also applies to existing construction and assemblies.
- B. Extent of Fire Stopping: Stop the passage of flame and products of combustion including smoke:
  - 1. At all penetrations through fire barrier and smoke barrier assemblies including empty openings and openings containing penetrations.
  - 2. At all items interrupting the continuity of fire barrier and smoke barrier assemblies.
  - 3. At the entire perimeter of fire barrier and smoke barrier assemblies.
  - 4. At locations specified in the Building Code.
- C. Extent of Smoke Stopping: Stop the passage of products of combustion including smoke:
  - 1. At all penetrations through smoke partition assemblies including empty openings and openings containing penetrations.
  - 2. At all items interrupting the continuity of smoke partition assemblies.
  - 3. At the entire perimeter of smoke partition assemblies.
  - 4. At locations specified in the Building Code.
- D. Definition: All of the following are "fire barriers" and "smoke barriers".
  - 1. Assemblies identified on the drawings as fire rated.
  - 2. Assemblies containing a fire rated door.
  - 3. All assemblies enclosing: mechanical rooms, electric rooms, stairs, elevator machine rooms, elevator hoistways, shafts, chases, and storage rooms.

1.03 SUBMITTALS:

- A. Product Data: For each material and product used, submit manufacturer's product data including instructions, recommendations, and restrictions.
  - 1. Performance Requirements: Highlight product data to show compliance with specified performance requirements.
- B. Installer Qualifications: Submit evidence of installer qualifications.

1.04 QUALITY ASSURANCE:

- A. Installer Qualification: Factory Mutual 4991 Approved Contractor, unless otherwise allowed by Owner.
- B. In Place Samples of Visible Work:
  - 1. Comply with Section 01 4337 In Place Samples.

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FIRE STOPPING AND SMOKE STOPPING

2. Running Work: Provide minimum 8 feet long samples.
3. Localized Work: Provide one sample of each condition and detail.

1.05 DELIVERY, STORAGE, HANDLING:

- A. Comply with Division 01 General Requirements and manufacturer's instructions and recommendations.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Hilti Corporation [www.us.hilti.com](http://www.us.hilti.com)
- B. Nelson Firestop Products [www.nelsonfirestop.com](http://www.nelsonfirestop.com)
- C. The RectorSeal Corporation [www.rectorseal.com](http://www.rectorseal.com) including brands:
  1. Bio Fireshield [www.biofireshield.com](http://www.biofireshield.com)
  2. Metacaulk [www.metacaulk.com](http://www.metacaulk.com)
- D. Specified Technologis, Inc., [www.stifirestop.com](http://www.stifirestop.com)
- E. 3M Corporation, [www.3m.com](http://www.3m.com)

2.02 FIRE STOPPING AND SMOKE STOPPING PERFORMANCE SPECIFICATIONS:

- A. Building Codes: Meet Building Codes and requirements of authorities having jurisdiction.
- B. Tested, Listed Fire Stop Systems Required: For each location and condition, provide fire stop systems tested, classified, and listed by nationally recognized independent testing agencies.
- C. Single Source: For all fire stop systems, provide systems from one manufacturer.
- D. Standards: Comply with:
  1. ASTM E 84 UL 723 Standard Test Method For Surface Burning Characteristics of Building Materials.
  2. ASTM E 119 UL 263 Methods of Fire Tests of Building Construction and Materials.
  3. ASTM E 814 UL 1479 Standard Test Method For Fire Tests of Through-Penetration Firestops. ASTM E 1399 Test Method for Cyclic Movement and Measuring Minimum and Maximum Joint Width.
  4. ASTM E 1966 UL 2079 Test Method For Resistance of Building Joint Systems.
  5. ASTM E 2307 Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-Story Test Apparatus
- E. Material Fire Performance:
  1. ASTM E84 Flame Spread: 25.
  2. ASTM E84 Smoke Developed: 50.
- F. In Service Temperature: Provide materials with in service temperature range appropriate for installation location.
- G. Water Resistance Performance: Provide water resistant systems [after curing] when in contact with:
  1. Floors.
  2. Exterior assemblies.

- 3. Water vapor to liquid water condensing surfaces.
  - H. Acoustical Performance: Equal or greater than STC of the assembly in which the system is installed.
  - I. Mold Resistance Performance: Required for material before and after curing.
    - 1. Standard: ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
    - 2. Performance: 10, no mold growth.
  - J. Solvent Restriction: When in contact with plastic, provide materials which do not damage plastic.
  - K. Environmental Characteristics:
    - 1. VOC Limit: Maximum 250 grams per liter, less water.
    - 2. Mineral Fiber Recycled Content: Minimum 70 percent postindustrial Thermafiber, Inc.
    - 3. Odors: Provide materials with no objectionable odors.
    - 4. Regulated Materials: Provide materials free of asbestos, lead, PCBs, and regulated materials.
    - 5. Regulated Waste: Provide materials which do not require special waste disposal.
  - L. Maintenance and Renovation Requirements: For locations requiring routine maintenance or renovation, provide either:
    - 1. Modular, "pillow" systems which can be easily removed and reinstalled without damage.
    - 2. Pathway" system which provide performance whether empty or full example: "EZ-Path", Specified Technologies Inc., [www.stifirestop.com](http://www.stifirestop.com).
  - M. FM Global Approved Materials: Required.
- 2.03 ADDITIONAL REQUIREMENTS FOR FIRE RATED SMOKE BARRIERS:
- A. Provide smoke (1 hr fire) stopping systems meeting Contract requirements.
- 2.04 ADDITIONAL REQUIREMENTS FOR NON FIRE RATED SMOKE PARTITIONS:
- A. Material: Provide materials:
    - 1. Consistent with the Building Code "Construction Classification.
    - 2. Approved by the local Building Inspector, Fire Inspector, and authorities having jurisdiction.
  - B. Maximum Air Leakage: 0.1 cubic foot of air per minute per square foot of surface area at pressure difference of 0.30 inch water gage at both ambient temperature and at 400 degrees F.
- 2.05 ADDITIONAL REQUIREMENTS FOR SYSTEM ACCESSORIES:
- A. Provide all materials, products, components, and accessories needed including, without limitation: temporary forms, primers, sealants, collars, cover plates, sleeves, anchors, fasteners, masking tape, and other materials and products.
- 2.06 FIRE STOPPING AND SMOKE STOPPING IDENTIFICATION LABELS:
- A. Basic Requirements:
    - 1. Material: Self-adhesive "peel and stick" water resistant label.
    - 2. Size: Minimum 6 x 6 inches.

3. Colors: Black copy on yellow or orange label.
  4. Copy Size: Minimum 0.2 inch high capital letters.
  5. Font: Helvetica initial capitals.
  6. Printing: Waterproof ink.
- B. Copy: Provide the following information on each label.
1. "Fire Stop/Smoke Stop - Do Not Disturb".
  2. "This Is An Important Building Fire Safety System".
  3. "UL Design Number = Contractor complete with UL Design Number".
  4. "Fire Rating Hours = [Contractor complete with hourly rating]".
  5. Installation contractor's name, address, telephone.
  6. Installation date.
  7. Manufacturer's name of products used.

### PART 3 - EXECUTION

#### 3.01 FIRE STOPPING AND SMOKE STOPPING INSTALLATION REQUIREMENTS:

- A. Comply with manufacturer's instructions and recommendations.
- B. Meet Contract requirements.
- C. Install to match tested and listed systems and designs, or approved engineering judgments.
- D. If multiple layers of ceramic or fiber materials are used, offset joints at least 6 inches.
- E. If stick clip supports are used, mechanically attach. Adhesive alone is not acceptable.
- F. Clean and remove excess and spilled materials.
- G. Protect installed materials from contamination, damage, and deterioration.

#### 3.02 COORDINATION AND INSPECTION:

- A. Standards:
  1. ASTM E 2174 Standard Practice for On-Site Inspection of Installed Fire Stops
  2. ASTM E 2393 Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers
- B. Coordinate fire and smoke stop work with other work to minimize disturbance of installed stops.
- C. Inspect before inspection by Owner and authorities having jurisdiction.
- D. Make corrections, if needed, before inspection by Owner and authorities having jurisdiction.
- E. Obtain inspection and approval from Owner and authorities having jurisdiction before concealing.

#### 3.03 WORK VISIBLE IN THE COMPLETED PROJECT: DETAIL AS SHOWN OR, IF NOT SHOWN:

- A. Provide smooth, flat, planar fire stop and smoke stop surfaces flush with the adjacent surface.
- B. Do not expose any mineral fiber, glass fiber, ceramic fiber, or any other fiber in the completed work.

- C. Tool visible surface to create uniform architectural appearance matching approved samples.
- D. Provide visible color to match adjacent visible finish material.

3.04 INSTALLATION OF FIRE STOP AND SMOKE STOP IDENTIFICATION LABELS:

- A. Locations: Adjacent to every installed fire stop and smoke stop on both sides of the assembly.
  - 1. Labels are not required on inaccessible side of assembly.
- B. Location Restriction: Do not install labels at locations normally visible to building occupants such as public accessible spaces without ceilings.
- C. Installation:
  - 1. Clean substrates and apply labels.
  - 2. Install labels to be easy to read by maintenance staff.

END OF SECTION 078410 07 8410



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## SECTION 07 9200 JOINT SEALANTS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

#### 1.02 SECTION INCLUDES:

- A. Furnish and Install: Joint sealants.
- B. Extent: As shown and additionally:
  - 1. All joints between dissimilar materials.
  - 2. All joints between similar materials.
  - 3. Interior control joints.
  - 4. Exterior control joints.
  - 5. Vertical concave inside corner masonry to masonry joints.
  - 6. Visible perimeters of door frames, other frames, and trims
  - 7. Completely around all plumbing fixtures, fittings, and trim at counter tops, walls, and floors.
  - 8. Perimeters of all exterior penetrations.
  - 9. Provide sealant at all condition of:
    - a. change in material
    - b. change in plane

#### 1.03 RELATED SECTIONS:

- A. Section 062000 FINISH CARPENTRY
- B. Section 084113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
- C. Section 092500 Gypsum Board.
- D. Section 093000 Tiling;
- E. Section 099000 Paints and Coatings

#### 1.04 SUBMITTALS:

- A. Product Data: Manufacturer's data including instructions, recommendations, and restrictions.
  - 1. Primers: Submit information on primer to be used for each sealant and substrate.
- B. Initial Selection Samples: 2 inches long.

#### 1.05 DELIVERY, STORAGE, HANDLING:

- A. Comply with Division 01 General Requirements and manufacturer's instructions and recommendations.

1.06 WARRANTY:

- A. Manufacturer's standard warranty.
- B. Manufacturers' Warranty Period for Exterior Sealants: 20 years.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Bostik, Inc., [www.bostik.com](http://www.bostik.com)
- B. DAP, Inc., [www.dap.com](http://www.dap.com).
- C. Dow Corning Corporation, [www.dowcorning.com](http://www.dowcorning.com)
- D. Emseal Joint Systems, Ltd, [www.emseal.com](http://www.emseal.com)
- E. Franklin Adhesives, [www.franklinadhesives.com](http://www.franklinadhesives.com)
- F. GE Sealants, [www.geadvancedmaterials.com](http://www.geadvancedmaterials.com), Momentive Performance Materials, Inc.
- G. Henkel Corporation, [www.osiproseries.com](http://www.osiproseries.com)
- H. Pecora Corporation, [www.pecora.com](http://www.pecora.com)
- I. Sika Corporation, [www.sikaconstruction.com](http://www.sikaconstruction.com)
- J. Sonneborn, BASF Chemical Company, [www.buildingsystems.basf.com](http://www.buildingsystems.basf.com)
- K. Tremco, Inc. [and Vulkem], RPM Company, [www.tremcosealants.com](http://www.tremcosealants.com).
- L. USG Corporation, [www.usg.com](http://www.usg.com).

2.02 JOINT SEALANT TYPE 1: Low modulus, one part, silicone sealant.

- A. Basis of Design: "790 Silicone Building Sealant", Dow Corning,
  - 1. Do Not Use For: Structural sealant, water immersion, confined space atmospheric cures.
- B. Movement Capability: Plus 100 percent expansion, minus 50 percent compression
- C. Colors: Selected by Architect from manufacturer's range of 11 standard colors.
- D. VOC Content: 50 g/l
- E. Primer - Porous Substrates, Masonry, Cast Stone, Mortar: None.
- F. Primer - Non Porous Substrates, Painted Aluminum: "1200" or "1593", Dow Corning.
- G. Backer Rod: Closed cell, expanded polyethylene.
  - 1. Standard: ASTM C1330 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
- H. Bond Breaker Tape: "CRL Bond Breaker Tape", C. R. Laurence Company, [www.crlaurence.com](http://www.crlaurence.com)

- 2.03 JOINT SEALANT TYPE 2: Paintable interior sealant.
- A. Basis of Design: "Tremflex 834", Tremco, Inc. Tremco, Inc. [www.tremcosealants.com](http://www.tremcosealants.com)
  - B. Movement Capability:  $\pm 12$  percent.
  - C. Colors: Selected by Architect from manufacturer's complete range of standard colors.
  - D. VOC Content:  $\approx 25$  g/l
  - E. Primers: Not required for most substrates. Comply with sealant manufacturer's instructions.
  - F. Backer Rod: Closed cell polyethylene.
    - 1. Standard: ASTM C1330 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
  - G. Bond Breaker Tape: "CRL Bond Breaker Tape", C. R. Laurence Company, [www.crlaurence.com](http://www.crlaurence.com)
- 2.04 JOINT SEALANT TYPE 3: Sanitary interior sealant.
- A. Basis of Design: "Tremsil 200" With Fungicide, Tremco Inc., [www.tremcosealants.com](http://www.tremcosealants.com)
  - B. Colors: Selected by Architect from manufacturer's complete range of standard colors.
  - C. VOC Content:  $\approx 5$  g/l
  - D. Primers: Comply with sealant manufacturer's instructions.
  - E. Backer Rod: Closed cell polyethylene.
    - 1. Standard: ASTM C1330 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
  - F. Bond Breaker Tape: "CRL Bond Breaker Tape", C. R. Laurence Company, [www.crlaurence.com](http://www.crlaurence.com)
- 2.05 JOINT SEALANT TYPE 4: Multi part polyurethane, traffic bearing sealant.
- A. Basis of Design: "THC900/901", Tremco, Inc. [www.tremcosealants.com](http://www.tremcosealants.com)
    - 1. Use Restriction: Not for water immersion.
  - B. Movement Capability:  $\pm 25$  percent.
  - C. Colors: Selected by Architect from manufacturer's complete range of tintable base colors.
  - D. VOC Content:  $\approx 250$  g/l
  - E. Primer - Porous Substrates: "Deckline Primer", Tremco, Inc. [www.tremcosealants.com](http://www.tremcosealants.com)
  - F. Primer - Non Porous Substrates: "TremPrime", Tremco, Inc. [www.tremcosealants.com](http://www.tremcosealants.com)
  - G. Backer Rod: Closed cell or reticulated polyethylene.
    - 1. Standard: ASTM C1330 Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

- H. Bond Breaker Tape: "CRL Bond Breaker Tape", C. R. Laurence Company, [www.crlaurence.com](http://www.crlaurence.com)

2.06 JOINT SEALANT TYPE 5: PRECOMPRESSED SEALANT TAPE.

- A. Basis of Design: "Seismic Colorseal", Emseal Joint Systems, Ltd., [www.emseal.com](http://www.emseal.com)
- B. Movement Capability:  $\pm 50$  percent.
- C. Colors: Selected by Architect from manufacturer's range of 26 colors.
- D. Terminations and Transitions: Provide factory fabricated "Universal 90's".
- E. Joint Sealant: Furnished by sealant tape manufacturer and color matched to sealant tape.

2.07 JOINT SEALANT TYPE 6: Precompressed acoustical sealant tape.

- A. Basis of Design: Quiet Joint SHG", Emseal Joint Systems, [www.emseal.com](http://www.emseal.com)
- B. Coated Sides: Three.
- C. Colors: Selected by Architect from manufacturer's range of 26 colors.

PART 3 - EXECUTION

3.01 JOINT SEALANT INSTALLATION:

- A. Comply with manufacturer's instructions and recommendations including, without limitation, environmental limits, substrate temperature, substrate moisture, substrate preparation.
- B. Standard: ASTM C1193 Standard Guide for Use of Joint Sealants.
- C. Joint Sealant Width and Depth: Comply with sealant manufacturer's recommendations:
  - 1. Joint Width:  $\approx 4$  times expected joint movement and  $\approx 0.25$  inch.
  - 2. Joint Depth: One half of joint width and  $\approx 0.375$  inch.
- D. Preparation:
  - 1. Clean and prepare substrates and sealant contact surfaces.
  - 2. Roughen surfaces to which sealant is adhered to improve bond.
  - 3. Remove loose and friable substrate materials down to sound materials.
  - 4. Remove laitance, soil, grease, oil, and all contamination.
- E. Masking: Mask adjacent surfaces to control liquid sealant and primer spillage.
- F. Primer: Comply with manufacturer's instructions and recommendations.
  - 1. Do not over prime.
  - 2. Allow primer to dry.
  - 3. Apply sealant immediately after primer is sufficiently dry.
- G. Backer Rod:
  - 1. Install backer rods wherever possible, but not for pre-compressed sealant tape.
  - 2. Sealant cross section shall be "hour glass" shape with wide adhesion and thin center.
  - 3. Control depth of backer rod to control sealant shape and sealant depth thickness.
  - 4. Control depth of backer rod so compressed sealant does not protrude from joint.

5. Install backer rods without twisting or distortion.
  6. Do not puncture or damage closed cell back rods to prevent outgassing and sealant bubbles.
- H. Bond Breaker Tape: Where joint depth cannot accommodate backer rod, provide bond breaker tape at back of joint to prevent three side adhesion.
- I. Liquid Joint Sealant Installation:
1. Provide uniform, continuous sealant without air gaps and voids.
  2. Force sealant into joints. Do not drag sealant into joints.
  3. Tool visible sealants to provide smooth, uniform, continuous, slightly concave sealant surfaces.
  4. Do not tool with water, soap solutions, alcohol, or solvents.
  5. Control and manage curing of sealants.
  6. Remove masking and temporary protection.
  7. Remove spilled and excess sealant.
- J. Precompressed Sealant Tape Installation:
1. Remove release agent from silicone facing with sealant tape manufacturer's recommended solvent and clean wipes.
  2. Apply sealant to end of silicone facing.
  3. Remove adhesive release paper and install sealant tape into joint from bottom up.
  4. Do not pull, stretch, or twist sealant tape.
  5. Provide uniform appearance, tape tension, face plane, and face depth.
  6. Form and seal joints as directed by manufacturer.
  7. After sealant tape is fully expanded into joint, provide continuous, tooled, sealant "corner beads" at both edges of sealant tape.
  8. Visually match approved samples.
- K. Weep Holes: Do not seal over weep holes. Do not seal over, then reopen weep holes.
- 3.02 INCOMPATIBLE SEALANTS: Where incompatible sealants intersect:
- A. Provide 0.032 inch thick aluminum septum between the incompatible sealants.
  - B. Adhere both sealants to the aluminum septum.
  - C. Conceal the aluminum septum in the sealant joint.
- 3.03 ADDITIONAL REQUIREMENTS FOR SEALANTS IN CONTACT WITH AIR BARRIERS:
- A. Comply with air barrier manufacturer's Section 072500 Weather Barriers and joint sealant manufacturer's compatibility recommendations and curing recommendations.

END OF SECTION 07 9200

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SECTION 08 1113  
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

B. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.03 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

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HOLLOW METAL DOORS AND FRAMES



- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Include the following:
  1. Elevations of each door design.
  2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
  3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
  4. Locations of reinforcement and preparations for hardware.
  5. Details of anchorages, joints, field splices, and connections.
  6. Details of accessories.
  7. Details of moldings, removable stops, and glazing.
  8. Details of conduit and preparations for power, signal, and control systems.
- D. Samples for Verification:
  1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

#### 1.04 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40" above sill) or UL 10C.
  1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
  2. Temperature-Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
  3. Smoke Control Door Assemblies: Comply with NFPA 105.
    - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Fire-Rated, Borrowed-Light Frame Assemblies: Assemblies complying with NFPA 80 that are listed and labeled, by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 257. Provide labeled glazing material.
- E. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.
  - 1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

#### 1.06 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

#### 1.07 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.
- B. Building Information Modeling (BIM) Support: Utilize designated BIM software tools and obtain training needed to successfully participate in the Project BIM processes. All technical disciplines are responsible for the product data integration and data reliability of their Work into the coordinated BIM applications.

#### 1.08 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
- B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:
  - 1. CECO Door Products (C).
  - 2. Curries Company (CU).
  - 3. Steelcraft (S).

#### 2.02 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

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HOLLOW METAL DOORS AND FRAMES

- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

## 2.03 HOLLOW METAL DOORS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.
- B. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:
  - 1. Design: Flush panel.
    - a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.
  - 2. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
  - 3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
  - 4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
  - 5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.
- C. Manufacturers Basis of Design:
  - 1. Curries Company (CU) - Polystyrene Core - 707 Series.

## 2.04 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.
  - 1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
  - 2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
  - 3. Manufacturers Basis of Design:
    - a. Curries Company (CU) - CM Series.
    - b. Curries Company (CU) - M Series.
- C. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated.
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

## 2.05 FRAME ANCHORS

- A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
  2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
- B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.
- C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

## 2.06 LIGHT OPENINGS AND GLAZING

- A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator's shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.
- B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.
- C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.
- D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

## 2.07 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

## 2.08 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.
- C. Hollow Metal Doors:
  1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified.
  2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
  3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.

4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
- D. Hollow Metal Frames:
1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
  2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
    - a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.
  3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
  4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
  5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
  6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
  7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
  8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
  9. Jamb Anchors: Provide number and spacing of anchors as follows:
    - a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      - 1) Two anchors per jamb up to 60 inches high.
      - 2) Three anchors per jamb from 60 to 90 inches high.
      - 3) Four anchors per jamb from 90 to 120 inches high.
      - 4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.
    - b. Stud Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
      - 1) Three anchors per jamb up to 60 inches high.
      - 2) Four anchors per jamb from 60 to 90 inches high.
      - 3) Five anchors per jamb from 90 to 96 inches high.
      - 4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
      - 5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions.
  10. Door Silencers: Except on weatherstripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".
  11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.
- E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door

Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

## 2.09 STEEL FINISHES

- A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of rust inhibiting shop primer.
  1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc.).
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 PREPARATION

- A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.
- C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware.

### 3.03 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

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HOLLOW METAL DOORS AND FRAMES

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.
  2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
  3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
  4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.
- C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Standard Steel Doors:
    - a. Jamb and Head: 1/8 inch plus or minus 1/16 inch.
    - b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
    - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
    - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.
  2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

### 3.04 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

### 3.05 FIELD QUALITY CONTROL

- A. Field Inspection (Punch Report): Reference Division 01 Sections "Closeout Procedures". Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.
  1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

END OF SECTION 08 1113

## SECTION 08 3100 ACCESS DOORS AND PANELS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Wall mounted hollow metal frame with key lock access units.
- B. Ceiling mounted frameless with key lock access units.
  - 1. Keylocks to be coordinated with Owner keying system; Refer to Hardware Section.

#### 1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware: Mortise cylinder and core hardware.
- B. Section 09 9113 - Exterior Painting: Field paint finish.
- C. Section 09 9123 - Interior Painting: Field paint finish.
- D. Section 23 3300 - Air Duct Accessories: Access doors in ductwork.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.
- C. Shop Drawings: Indicate exact position of each access door and/or panel unit.
- D. Project Record Documents: Record actual locations of each access unit.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

### PART 2 PRODUCTS

#### 2.01 ACCESS DOORS AND PANELS ASSEMBLIES

- A. Wall-Mounted Units:
  - 1. Location: As indicated on drawings or as required by MPE work.
  - 2. Panel Material: Stainless steel, Type 304.
  - 3. Size: 12 by 12 inches
- B. Ceiling-Mounted Units:

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ACCESS DOORS AND PANELS



1. Location: As indicated on drawings.
2. Panel Material: Aluminum extrusion with gypsum board inlay.
3. Provide Frameless type for use in GWB ceiling with intergal spakel edge per Basis of Design.
4. Size - Other Ceilings: 36 by 36 inches or as otherwise shown on drawings.
5. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.

## 2.02 CEILING MOUNTED ACCESS UNITS

### A. Manufacturers:

1. Activar Construction Products Group, Inc. - JL Industries: [www.activarcpg.com/#sle](http://www.activarcpg.com/#sle).
  - a. Concealed-Frame Access Panel: Activar/JL Industries CT.
  - b. Basis of Design model: MODEL TMW™ FLUSH ACCESS PANEL WITH WALLBOARD BEAD with Torax head cam or as otherwise selected from manufacturers standard locking decives.
  - c. Or approved equal by the following manufacturers:
2. Babcock-Davis: [www.babcockdavis.com/#sle](http://www.babcockdavis.com/#sle).
3. Bauco Access Panel Solutions Inc: [www.accesspanelsolutions.com/#sle](http://www.accesspanelsolutions.com/#sle).
  - a. Concealed Hardware and Gypsum Board Inlay: Bauco Plus II - Access Panels.
  - b. Circular with Concealed Hardware and Gypsum Board Inlay: Bauco Rondo - Circular Access Panels for Drywall.
4. Cendrex, Inc: [www.cendrex.com/#sle](http://www.cendrex.com/#sle).
  - a. Concealed Flange and Latch Units: Cendrex CTR-MAG.

### B. Ceiling Mounted Units: Factory fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.

1. Style: Frameless UNO on drawings.
2. Door Style: Single thickness with rolled or turned in edges.
3. Stainless Steel Finish: No. 4 brushed finish.
4. Door/Panel Size: As indicated on the drawings.
5. Hardware:
  - a. Walls: Non-rated Panel and Frame Unit: Stainless steel frame, stainless steel panel, continuous off-set concealed hinge, key operated vandal-resistant lock.
  - b. Ceilings: Bonderized steel frame, bonderized steel panel, continuous hinge, key operated vandal resistant lock.
  - c. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
  - d. Latch/Lock: Cylinder lock-operated cam latch, two keys for each unit.
    - 1) Mortise cylinder and core as specified in Section 08 7100.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that rough openings are correctly sized and located.
- B. Begin installation only after substrates have been properly prepared, and if the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.02 PREPARATION

- A. Clean surfaces thoroughly prior to proceeding with this work.

- B. Prepare surfaces using methods recommended by manufacturer for applicable substrates in accordance with project conditions.

3.03 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install frames plumb and level in openings, and secure units rigidly in place.
- C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION 08 3100

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## SECTION 08 3313 COILING COUNTER DOORS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Non-fire-rated coiling counter doors and operating hardware.

#### 1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Rough openings.
- B. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.
- C. Section 08 7100 - Door Hardware: Cylinder cores and keys.
- D. Section 09 2116 - Gypsum Board Assemblies: Rough openings.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.
- D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.
- E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.
- G. UL (DIR) - Online Certifications Directory Current Edition.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's standard literature showing materials and details of construction and finish. Include data on electrical operation.
- C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details.
- D. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.

## 1.05 QUALITY ASSURANCE

- A. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Coiling Counter Doors:
  - 1. Basis of Design: **Cookson**: 1901 South Litchfield Road, Goodyear, AZ 85338. Telephone: (800) 294-4358.
  - 2. Subject to compliance with requirements and approval of appearance, size, compatibility and performance by the following:
  - 3. Cornell
  - 4. Clopay Building Products
  - 5. Amarr
  - 6. Alpine Overhead Doors, Inc: [www.alpinedoors.com/#sle](http://www.alpinedoors.com/#sle).
  - 7. C.H.I. Overhead Doors; Model 6522 (steel): [www.chiohd.com/#sle](http://www.chiohd.com/#sle).
  - 8. Raynor Garage Doors: [www.raynor.com/#sle](http://www.raynor.com/#sle).

### 2.02 COILING COUNTER DOORS

- A. Basis of Design Product: Cookson: Model: ESC10
- B. Coiling Counter Doors, Non-Fire-Rated: Aluminum slat curtain.
  - 1. Mounting: Between jambs, within prepared opening.
  - 2. Nominal Slat Size: 1-1/4 inches wide.
  - 3. Slat Profile: Flat, perforated.
  - 4. Finish, Aluminum: Anodized.
  - 5. Guides: Formed track; same material and finish unless otherwise indicated.

### 2.03 MATERIALS

- A. Curtain Construction: Interlocking, single thickness slats.
  - 1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
  - 2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.
  - 3. Aluminum Slats: ASTM B221 (ASTM B221M), aluminum alloy Type 6063; minimum thickness 0.05 inch.
  - 4. **Aluminum**: No. 1F, interlocked flat-faced slats, 1-1/2 inches (38 mm) high by 1/2 inch (13 mm) deep, minimum 0.040 inch aluminum with extruded tubular aluminum bottom bar with continuous lift handle and vinyl astragal
- B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
  - 1. Aluminum Guides: Extruded aluminum channel, with wool pile runners along inside.
  - 2. Aluminum: Heavy duty extruded aluminum sections with snap-on cover to conceal fasteners. Provide polypropylene pile runners on both sides of curtain to eliminate metal to metal contact between guides and curtain.

- C. Endlocks:
  1. Fabricate interlocking slat sections with high strength molded nylon endlocks riveted to ends of alternate slats
- D. Lock Hardware:
  1. Cylindrical Locking Mechanism: Latchset lock cylinder, specified in Section 08 7100.
  2. Latch Handle: Manufacturer's standard.
  3. Slide Bolt: Provide on single-jamb side, extending into slot in guides, with padlock on one side.
  4. Manual Chain Lift: Provide padlockable chain keeper on guide.
- E. Hood: Minimum [24 gauge galvanized steel] [24 gauge stainless steel] [0.040 inch (1.016 mm) aluminum] with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets.
- F. **Brackets:** Fabricate from reinforced steel plate with bearings at rotating support points to support counterbalance shaft assembly and form end closures
- G. Roller Shaft Counterbalance: Steel pipe and torsion steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.
  1. **Barrel:** Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width
  2. **Spring Balance:** Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque

## 2.04 FINISHES

- A. Aluminum: Clear anodized for all exposed components UNO

## 2.05 OPERATION

- A. Manual Operation:
  1. **Crank Hoist:** Crank hoist operator including crank gear box, steel crank drive shaft and geared reduction unit. Fabricate gear box to completely enclose operating mechanism and be oil-tight.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that opening sizes, tolerances and conditions are acceptable.
- B. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings
- C. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates
- D. Commencement of work by installer is acceptance of substrate

3.02 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Install perimeter trim as indicated.

3.03 TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.04 ADJUSTING

- A. Adjust operating assemblies for smooth and noiseless operation.

3.05 CLEANING

- A. Clean installed components.
- B. Remove labels and visible markings.

3.06 DEMONSTRATION

- A. Demonstrate proper operation to Owner's Representative
- B. Instruct Owner's Representative in maintenance procedures

END OF SECTION 08 3313

SECTION 08 4113  
ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.01 Related Documents

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 01 sections.
- B. Refer to Alternates and performance requirements.

1.02 Summary

- A. Section Includes: Architectural Dark Bronze Aluminum Framed Insulated Safety Glass Main Entry Doors and side lights as indicated on drawings.
  - 1. Exterior Doors and Transom
  - 2. Interior Doors, Transom and Side Lites
- B. Related Sections:
  - 1. 079200 "Joint Sealants"
  - 2. 087100 "Door Hardware"
  - 3. 088100 "Glazing"

1.03 Definitions

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) - AAMA Glossary (AAMA AG).

1.04 Performance Requirements

- A. Storefront System Performance Requirements:
  - 1. Wind loads: Provide storefront system; include anchorage, capable of withstanding wind load design pressures. The design pressures are based on the latest Building Code.
  - 2. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft<sup>2</sup> (0.3 l/s · m<sup>2</sup>) at a static air pressure differential of 6.24 psf (300 Pa).
  - 3. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 8 psf (383 Pa) as defined in AAMA 501.
  - 4. Uniform Load: A static air design load of 20 psf (958 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
  - 5. Delegated Design: Design glazed aluminum framed system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
  - 6. Thermally Broken and compliant code and able to pass comcheck.
- B. Environmental Product Declarations (EPD): Shall have a Type III Product-Specific EPD created from a Product Category Rule.



- C. Recycled Content: Provide documentation indicating postconsumer recycled content plus one-half preconsumer recycled content.
- D. VOC Emissions for Sealants: Provide certificate of compliance with California Department of Public Health (CDPH) Standard Method v1.1-2010, using the applicable exposure scenario.
- E. VOC Content for Sealants: Provide documentation of compliant VOC content for SCAQMD Rule 1168.

#### 1.05 Submittals

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum-framed storefront system indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum-framed storefront system and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum-framed storefront.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:
  1. Joinery, including concealed welds.
  2. Anchorage.
  3. Expansion provisions.
  4. Glazing.
  5. Flashing and drainage.
- G. Other Action Submittals:
  1. Entrance Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

#### 1.06 Quality Assurance

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of providing aluminum-framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. Source Limitations: Obtain aluminum-framed storefront system through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum-framed storefront system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.

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ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".
- 1.07 Project Conditions
- A. Field Measurements: Verify actual dimensions of aluminum-framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.
- 1.08 Warranty
- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

## PART 2 PRODUCTS

- 2.01 Manufacturers
- A. Basis-of-Design Product:
1. Kawneer Company Inc.
  2. Trifab™ 451T Framing System (Thermally broken, 2" Sightline)
  3. System Dimensions: 2" x 4-1/2" (50.8 mm x 114.3 mm) (Front Set) Framing Dimensions and as indicated on drawings
  4. Glass: Front Plane
  5. Thermal Break; 1" Insulated Glazing Units (IGUs) meeting IECC 2015: U factor .45, SHGC .4 (clear).
- B. Subject to compliance with requirements, provide a comparable product by the following:
1. YKK
  2. Wausau
- 2.02 Materials
- A. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8 mm) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
1. Recycled Content: Shall have a minimum of 50% mixed pre- and post-consumer recycled content.
    - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
    - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
    - c. Indicate location recovery of recycled content.
    - d. Indicate location of manufacturing facility.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum framing members, trim hardware, anchors, and other components.

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ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- E. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- F. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.
- G. Red List Free: All parts and materials comply with the Living Building Challenge/DECLARE Red List and the Cradle-to-Cradle (C2C) Banned List.
  - 1. PVC free
  - 2. Neoprene free

#### 2.03 Storefront Framing System

- A. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- B. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
- C. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- D. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- E. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.

#### 2.04 Glazing Systems

- A. Glazing: As specified in Section 088100 "Glazing".
- B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
- C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
- D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
- E. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:

1. Structural Sealant: ASTM C 1184, single-component neutral-curing silicone formulation that is compatible with system components with which it comes in contact, specifically formulated and tested for use as structural sealant and approved by a structural-sealant manufacturer for use in aluminum-framed systems indicated.
  - a. Color: Black
2. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.
  - a. Color: Matching structural sealant.

#### 2.05 Entrance Door Systems

- A. Entrance Doors: As specified in Section 084113 "Aluminum-Framed Entrances and Storefronts".
- B. Entrance Door Hardware: As specified in Section 087100 "Door Hardware".

#### 2.06 Accessory Materials

- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Section 079200 "Joint Sealants".

#### 2.07 Fabrication

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
  1. Profiles that are sharp, straight, and free of defects or deformations.
  2. Accurately fit joints; make joints flush, hairline and weatherproof.
  3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
  4. Physical and thermal isolation of glazing from framing members.
  5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
  6. Provisions for field replacement of glazing.
  7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- B. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- C. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
- D. Storefront Framing: Fabricate components for assembly using manufacturer's standard installation instructions.
- E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

#### 2.08 Aluminum Finishes

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

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ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

- B. Factory Finishing:
  - 1. Kawneer Permanodic™ AA-M10C21A44 / AA-M45C22A44, AAMA 611, Architectural Class I Color Anodic Coating, Color: #40 Dark Bronze.

## PART 3 EXECUTION

### 3.01 Examination

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight aluminum- framed storefront system installation.
  - 1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
  - 2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
  - 3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
  - 4. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 Installation

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum-framed storefront system, accessories, and other components.
- B. Install aluminum-framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- D. Install aluminum-framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within aluminum-framed storefront system to the exterior.
- E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

### 3.03 Field Quality Control

- A. Field Tests: Architect shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
  - 1. Testing: Testing shall be performed by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements. Testing Standard per AAMA 503, including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 Water Infiltration Test.

- a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft<sup>2</sup>, whichever is greater.
  - b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 6.24 psf (300 Pa).
- B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.04 Adjusting, Cleaning, And Protection

- A. Clean aluminum surfaces immediately after installing aluminum-framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 084113 08 4113

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SECTION 08 7100.01  
DOOR HARDWARE SCHEDULE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section references specification sections relating to commercial door hardware for the following:

1. Swinging doors.
2. Sliding Doors.
3. Other doors to the extent indicated.

- B. Commercial door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical and access control door hardware.
3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.
4. Automatic operators.
5. Cylinders specified for doors in other sections.

- C. Related Sections:

1. Division 08 Section "Door Hardware".

- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

- E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.



### 1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
  - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
  - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
  - 3. Content: Include the following information:
    - a. Type, style, function, size, label, hand, and finish of each door hardware item.
    - b. Manufacturer of each item.
    - c. Fastenings and other pertinent information.
    - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    - e. Explanation of abbreviations, symbols, and codes contained in schedule.
    - f. Mounting locations for door hardware.
    - g. Door and frame sizes and materials.
  - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

- F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

#### 1.5 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

#### 1.6 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

### PART 2 - PRODUCTS

#### 2.1 SCHEDULED DOOR HARDWARE

- A. Refer to "PART 3 – EXECUTION" for required specification sections.

### PART 3 - EXECUTION

#### 3.1 DOOR HARDWARE SETS

- A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
  - 1. Quantities listed are for each pair of doors, or for each single door.
  - 2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
  4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
- B. Products listed in the hardware sets shall be supplied by and in accordance with the requirements described in the specification section as noted for each item.
1. Section 08 71 00 – Door Hardware.
- C. Manufacturer's Abbreviations:
1. MK - McKinney
  2. MR - Markar
  3. PE - Pemko
  4. RO - Rockwood
  5. YA - Arrow, formerly known as Yale
  6. RU - Corbin Russwin
  7. BE - BEST Locks & Closers
  8. RF - Rixson
  9. NO - Norton
  10. OT - Other
  11. SU - Securitron

### Hardware Sets

#### Set: 1.0

Doors: 113A

2 Continuous Hinge	CFM-SLF-HD1-M		PE
1 Concealed Vert Rod Exit, Exit Only	ED5860 EO M52	630	RU
1 Concealed Vert Rod Exit, Nightlatch	ED5860 K157ET M52	630	RU
3 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
2 Pull	RM201 Mtg-Type 12XHD	US32D-316	RO
2 Conc Overhead Stop	6-X36	630	RF
1 Surface Closer	DC6220 x mounting plate to suit application	689	RU
1 Automatic Opener	6300 series	689	NO ⚡
1 Threshold	1715AK MSES25SS		PE
1 Weatherstrip	- Integral within construction of door and frame assembly		OT

2 Sweep	29326CNB TKSP	PE
2 Door Switch	505	NO ⚡
2 Position Switch	DPS-M-BK	SU ⚡
1 Wiring Diagram	- Elevation and Point to Point as Specified	OT

Notes:

Door position switches to monitor / report open closed status of opening to security system.  
Automatic operator to be manually turned on / off each day at toggle switch at side of unit.  
Automatic operator by actuator.

**Set: 4.0**

Doors: 205A

6 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
2 Fire Rated Conc Vert Rod, Classroom	ED5860B L955ET M55	630	RU
2 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
2 Surface Closer	DC6210 A4	689	RU
2 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE
1 Astragal	S772C		PE

**Set: 5.0**

Doors: 205B

6 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
2 Fire Rated Conc Vert Rod, Classroom	ED5860B L955ET M55	630	RU
2 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
2 Surface Closer	DC6210 A4	689	RU
2 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE
1 Astragal	S772C		PE

**Set: 5.1**

Doors: 101, 121

6 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Dust Proof Strike	570	US26D	RO
1 Flush Bolt	555- 12"/72" AFF	US26D	RO

1 Mortise Exit Device, Classroom	ED5600L L9M55ET CT7SD	630	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6210 A3	689	RU
2 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
2 Silencer	608/609 (As Needed)		RO

**Set: 7.0**

Doors: 101A, 121A

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Rim Exit Device, Passage	ED5200 L910ET	630	RU
1 Surf Overhead Stop	10-X36	689	RF
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE

**Set: 8.0**

Doors: 205C, 205D

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Fire Rated Rim Exit, Passage	ED5200A L910ET	630	RU
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE

**Set: 8.1**

Doors: 105

3 Hinge, Wide Throw	TA2798 4-1/2" x ___ (supplier to confirm dimension)	US26D	MK
1 Fire Rated Rim Exit, Passage	ED5200A L910ET	630	RU
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE

**Set: 9.0**

Doors: 008A, 033

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Fire Rated Rim Exit, Passage	ED5200A L910ET	630	RU

1 Surf Overhead Stop	10-X36	689	RF
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE

**Set: 9.1**

Doors: 118

3 Hinge, Wide Throw	TA2798 4-1/2" x __ (supplier to confirm dimension)	US26D	MK
1 Fire Rated Rim Exit, Passage	ED5200A L910ET	630	RU
1 Surf Overhead Stop	10-X36	689	RF
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE

**Set: 10.0**

Doors: 001B, 017A, 017B, 025

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Rim Exit Device, Classroom	ED5200 L955ET	630	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6210 A3	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 11.0**

Doors: 204

3 Hinge, Full Mortise, Hvy Wt	T4A3786 [NRP]	US26D	MK
1 Fire Rated Rim Exit, Passage	ED5200A L910ET	630	RU
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE

**Set: 12.0**

Doors: 113B

2 Continuous Hinge	FM300	630	MR
2 Dummy Bar, Exit Only	ED5000DB EO	630	RU
2 Pull	RM201 Mtg-Type 12XHD	US32D-	RO

		316	
2 Surface Closer	DC6210 A4	689	RU
2 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
2 Silencer	608/609 (As Needed)		RO

**Set: 13.0**

Doors: 007A

1 Continuous Hinge	FM300	630	MR
1 Dummy Bar, Exit Only	ED5000DB EO	630	RU
1 Pull Plate	BF 111x70C	US32D	RO
1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 14.0**

Doors: 006A, 020, 026, 028, 036, 037A, A-003A

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Storeroom Lock	ML2057 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 15.0**

Doors: 001A, 015A, 015B, ST1-1

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Storeroom Lock	ML2057 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6210 A3	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 16.0**

Doors: 120, ST6-1

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Storeroom Lock	ML2057 LWA CT7SD	626	RU

1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 16.1**

Doors: [ST5-4](#)

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Storeroom Lock	ML2057 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE

**Set: 17.0**

Doors: [204A](#)

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Storeroom Lock	ML2057 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6210 A4	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Gasketing	S88_ (Head & Jambs)		PE

**Set: 18.0**

Doors: [106A](#), [108](#), [110](#), [112A](#), [203A](#)

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Entrance Lock	ML2053 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 19.0**

Doors: [119](#), [210B](#)

6 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Dust Proof Strike	570	US26D	RO
2 Flush Bolt	555- 12"/72" AFF	US26D	RO



1 Classroom Lock	ML2055 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
2 Wall Stop	RM860/PM861 (As Needed)	US32D	RO

**Set: 20.0**

Doors: 009A, 108B, 110B, 112B, 115, 206C, 206D

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Classroom Lock	ML2055 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 21.0**

Doors: 034A, 108A, 110A, 112C, 112D, 112E, 112F, 119A,

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Classroom Lock	ML2055 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Conc Overhead Stop	5-x36	689	RF
3 Silencer	608/609 (As Needed)		RO

**Set: 22.0**

Doors: 206A, 206B

4 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Classroom Lock	ML2055 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6210 A3	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 23.0**

Doors: 202A

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Privacy Lock	ML2060 LWA V20	626	RU
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO

1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO
1 Coat Hook	RM823	US32D	RO

**Set: 24.0**

Doors: 003B, 031

6 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Mortise Deadlock	B 357	626	YA
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
2 Push Pull	111x73C/73CL Mtg-Type 1HD	US32D	RO
1 Surface Closer	DC6210 A3	689	RU
1 Surface Closer	DC6210 A4	689	RU
2 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
2 Silencer	608/609 (As Needed)		RO

**Set: 25.0**

Doors: 104A, 117A

3 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Mortise Deadlock	B 357	626	YA
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Push Pull	111x73C/73CL Mtg-Type 1HD	US32D	RO
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 26.0**

Doors: 010B, 013B, 019

3 Hinge, Full Mortise, Hvy Wt	T4A3786 [NRP]	US26D	MK
1 Storeroom Lock	ML2057 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 27.0**

Doors: 034B

3 Hinge, Full Mortise, Hvy Wt	T4A3786 [NRP]	US26D	MK
1 Classroom Lock	ML2055 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 28.0**

Doors: 210A

4 Hinge, Full Mortise, Hvy Wt	T4A3786 [NRP]	US26D	MK
1 Classroom Lock	ML2055 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 29.0**

3 Hinge, Full Mortise, Hvy Wt	T4A3786 [NRP]	US26D	MK
1 Classroom Lock	ML2055 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 30.0**

Doors: 201, 208, 209A

3 Hinge, Full Mortise, Hvy Wt	T4A3786 [NRP]	US26D	MK
1 Classroom Lock	ML2055 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO

1 Gasketing S88\_ (Head & Jambs) PE

**Set: 31.0**

Doors: 005A

4 Hinge, Full Mortise, Hvy Wt	T4A3386 [NRP]	US32D	MK
1 Entrance Lock	ML2053 LWA CT7SD	626	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Surface Closer	DC6210 A3	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO
3 Silencer	608/609 (As Needed)		RO

**Set: 32.0**

Doors: 022, 024

3 Hinge, Full Mortise, Hvy Wt	T4A3786 [NRP]	US26D	MK
1 Mortise Deadlock	B 357	626	YA
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Pull Plate	BF 111x70C	US32D	RO
1 Push Pull	111x73C/73CL Mtg-Type 1HD	US32D	RO
1 Surface Closer	DC6200	689	RU
1 Kick Plate	K1050 = 10" H x 2" LDW CSK BEV	US32D	RO
1 Wall Stop	RM860/PM861 (As Needed)	US32D	RO

**Set: 34.0**

Doors: G1, G2, G3, G4, G5, G6, ST2-1, ST5-1

1 Rim Exit Device, Classroom	ED5200 L955ET	630	RU
1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE

Notes:

All other hardware to be provided with Gate / Screen.

**Set: 35.0**

Set: 35.0 Dutch Door

Doors: 207

4 Hinge, Full Mortise	TA2714 [NRP]	US26D	MK
1 Classroom Lock	ML2053 LWA CT7SD	626	RU

1 Permanent Cylinder	Match existing (5C7DD - High Security)		BE
1 Conc Overhead Stop	5-x36	689	RF
4 Silencer	608/609 (As Needed)		RO
1 Mortise Deadlock	B 357	626	YA
1 Latch Bolt			

END OF SECTION 080671

SECTION 08 7100  
DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

- B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.
4. Cylinders specified for doors in other sections.

- C. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
8. State Building Codes, Local Amendments.

- D. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

### 1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
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    - h. Warranty information for each product.
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- C. Shop Drawings: Details of electrified access control hardware indicating the following:
  - 1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:
    - a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.

- b. Complete (risers, point-to-point) access control system block wiring diagrams.
  - c. Wiring instructions for each electronic component scheduled herein.
- 2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- E. Informational Submittals:
  - 1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).
- C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.



- E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
  - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
  - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
  - 1. Function of building, purpose of each area and degree of security required.
  - 2. Plans for existing and future key system expansion.
  - 3. Requirements for key control storage and software.
  - 4. Installation of permanent keys, cylinder cores and software.
  - 5. Address and requirements for delivery of keys.
- H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
  - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
  - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
  - 3. Review sequence of operation narratives for each unique access controlled opening.
  - 4. Review and finalize construction schedule and verify availability of materials.
  - 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

## 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

## 1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

## 1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
  - 1. Structural failures including excessive deflection, cracking, or breakage.
  - 2. Faulty operation of the hardware.
  - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
  - 4. Electrical component defects and failures within the systems operation.
- C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
  - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Please note that ASSA ABLOY is transitioning the Yale Commercial brand to Arrow. This affects only the brand name; the products and product numbers will remain unchanged. The brand transition is expected to be complete in or about May of 2024, and products shipping after that time will be branded Arrow.
- D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

### 2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
  - 1. Quantity: Provide the following hinge quantity:
    - a. Two Hinges: For doors with heights up to 60 inches.
    - b. Three Hinges: For doors with heights 61 to 90 inches.
    - c. Four Hinges: For doors with heights 91 to 120 inches.
    - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
  - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
    - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
    - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
    - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
    - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
  4. Hinge Options: Comply with the following:
    - a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
  5. Manufacturers:
    - a. Hager Companies (HA) - BB Series, 5 knuckle.
    - b. McKinney (MK) - TA/T4A Series, 5 knuckle.
    - c. dormakaba Best (ST) - F/FBB Series, 5 knuckle.
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.
1. Manufacturers:
    - a. Hager Companies (HA).
    - b. Pemko (PE).
    - c. Dormakaba Best (ST).
- C. Pin and Barrel Continuous Hinges: ANSI/BHMA A156.26 Grade 1-600 pin and barrel continuous hinges with minimum 14 gauge Type 304 stainless steel hinge leaves, concealed stainless pin, and twin self-lubricated nylon bearings at each knuckle separation. Factory trim hinges to suit door height and prepare for electrical cut-outs.
1. Manufacturers:
    - a. Hager Companies (HA).
    - b. Markar Products; ASSA ABLOY Architectural Door Accessories (MR).
    - c. Pemko (PE).
    - d. Dormakaba Best (ST).

## 2.3 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
  2. Furnish dust proof strikes for bottom bolts.
  3. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
  4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
  5. Manufacturers:
    - a. Door Controls International (DC).
    - b. Rockwood (RO).
    - c. Trimco (TC).
- B. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
  2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
  3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
  4. Pulls, where applicable, shall be provided with a 10" clearance from the finished floor on the push side to accommodate wheelchair accessibility.
  5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
  6. Manufacturers:
    - a. Hiawatha, Inc. (HI).
    - b. Rockwood (RO).
    - c. Trimco (TC).

## 2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
1. Manufacturers:
    - a. dormakaba Best (BE).
    - b. Match Existing, Field Verify.
    - c. No Substitution.

- B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:
  - 1. Threaded mortise cylinders with rings and cams to suit hardware application.
  - 2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
  - 3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
  - 4. Tubular deadlocks and other auxiliary locks.
  - 5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
  - 6. Keyway: Manufacturer's Standard.
- C. Small Format Interchangeable Cores: Provide small format interchangeable cores (SFIC) as specified, core insert, removable by use of a special key; usable with other manufacturers' cylinders.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
  - 1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
  - 2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
  - 3. New System: Key locks to a new key system as directed by the Owner.
- E. Key Quantity: Provide the following minimum number of keys:
  - 1. Change Keys per Cylinder: Two (2)
  - 2. Master Keys (per Master Key Level/Group): Five (5).
  - 3. Construction Keys (where required): Ten (10).
- F. Construction Keying: Provide construction master keyed cylinders.
- G. Key Registration List (Bitting List):
  - 1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
  - 2. Provide transcript list in writing or electronic file as directed by the Owner.

## 2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
  - 1. Heavy duty mortise locks shall have a ten-year warranty.
  - 2. Where specified, provide status indicators with highly reflective color and wording for "locked/unlocked" or "vacant/occupied" with custom wording options if

required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1" x 0.6" with a curved design allowing a 180-degree viewing angle with protective covering to prevent tampering.

3. Manufacturers:

- a. Arrow, formerly known as Yale (YA) - 8800FL Series.
- b. Corbin Russwin Hardware (RU) - ML2000 Series.
- c. dormakaba Best (BE) - 45H Series.
- d. Sargent Manufacturing (SA) - 8200 Series.

B. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Operational Grade 1 Certified Products Directory (CPD) listed.

1. Vertical Impact: Exceed 100 vertical impacts (20 times ANSI/BHMA A156.2 requirements).
2. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
3. Locks are to be non-handed and fully field reversible.
4. Manufacturers:
  - a. Corbin Russwin Hardware (RU) - CLX3300 Series.
  - b. dormakaba Best (BE) - 9K Series.
  - c. Sargent Manufacturing (SA) - 10X Line.

## 2.6 AUXILIARY LOCKS

A. Mortise Deadlocks, Small Case: ANSI/BHMA A156.36, Grade 1, small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.

1. Manufacturers:

- a. Arrow, formerly known as Yale (YA) - 350 Series.
- b. dormakaba Best (BE) - 48H Series.
- c. Corbin Russwin Hardware (RU) - DL4000 Series.
- d. Sargent Manufacturing (SA) - 4870 Series.

## 2.7 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

## 2.8 ELECTRIC STRIKE & DOOR OPERATOR

A. Standard Electric Strikes: Electric strikes conforming to ANSI/BHMA A156.31, Grade 1, for use on non-rated or fire rated openings. Strikes shall be of stainless steel construction tested to a minimum of 1500 pounds of static strength and 70 foot-pounds of dynamic strength with a minimum endurance of 1 million operating cycles. Provide strikes with 12 or 24 VDC capability, fail-secure unless otherwise specified. Where specified provide latchbolt and latchbolt strike monitoring indicating both the position of the latchbolt and locked condition of the strike.

1. Manufacturers: Subject to compliance with requirements for compliant and complete system.
  - a. Basis of Design LCN -2850 Model with concealed mounting beneath the door head.
    - 1) As required to accommodate field conditions and with approval provide surface mounted equivalent.
  - b. Besam – SW200i
  - c. HES (HS) - 1006 Series.
  - d. Von Duprin (VD) - 6200/6400 Series.
  - e. Dormakaba <https://www.dormakaba.com/us-en/solutions/products/entrance-systems>
  - f. Beacon <https://www.beaconcdl.com/automatic-door-operators-simplified/>

## 2.9 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.
2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.



3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
  4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
  5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
  6. Flush End Caps: Provide flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
  7. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.
    - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.
  8. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
  9. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
  10. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
  11. Rail Sizing: Provide exit device rails factory sized for proper door width application.
  12. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.
1. Manufacturers:
    - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
    - b. Sargent Manufacturing (SA) - 80 Series.

- c. dormakaba Best (PR) - Apex 2000 Series.
- d. Von Duprin (VD) - 35A/98 XP Series.

## 2.10 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
  - 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
  - 2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
  - 3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
  - 4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
  - 5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
  - 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard..
  - 1. Manufacturers:
    - a. Corbin Russwin Hardware (RU) - DC6000 Series.
    - b. dormakaba (DO) - 8900 Series.
    - c. Norton Rixson (NO) - 7500 Series.
    - d. Sargent Manufacturing (SA) - 351 Series.

## 2.11 ELECTROMECHANICAL DOOR OPERATORS

- A. General: Provide low energy operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.
  - 1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.
- B. Standard: Conforming to ANSI/BHMA A156.19.
- C. Performance Requirements:
  - 1. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
  - 2. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.
- D. Configuration: Surface mounted or in-ground as required. Door operators to control single swinging and pair of swinging doors.
- E. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19.
- F. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.
- G. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.
- H. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.
- I. Wireless Interface: Operator units shall have a wireless interface via a mobile device for ease of installation and setup.
- J. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Norton Rixson (NO) - 6300 Series.

## 2.12 ARCHITECTURAL TRIM

### A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:
  - a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
  - a. Hiawatha, Inc. (HI).
  - b. Rockwood (RO).
  - c. Trimco (TC).

## 2.13 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
  1. Manufacturers:
    - a. Hiawatha, Inc. (HI).
    - b. Rockwood (RO).
    - c. Trimco (TC).

- C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

- 1. Manufacturers:

- a. Norton Rixson (RF).
- b. Rockwood (RO).
- c. Sargent Manufacturing (SA).

## 2.14 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
  - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
  - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Manufacturers:
  - 1. National Guard Products (NG).
  - 2. Pemko (PE).
  - 3. Reese Enterprises, Inc. (RE).

## 2.15 ELECTRONIC ACCESSORIES

- A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.
  - 1. Manufacturers:
    - a. Sargent Manufacturing (SA) - 3280 Series.
    - b. Security Door Controls (SD) - DPS Series.
    - c. Securitron (SU) - DPS Series.

## 2.16 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

## 2.17 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

### 3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

### 3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
  - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
  - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
  - 2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
  - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
  - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

### 3.4 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final

operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

### 3.5 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

### 3.6 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

### 3.7 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
  - 1. Quantities listed are for each pair of doors, or for each single door.
  - 2. The supplier is responsible for handing and sizing all products.
  - 3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
  - 4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.
- B. Refer to Section 080671, Door Hardware Sets, for hardware sets.

END OF SECTION 087100



## SECTION 08 8100 GLAZING

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 01 sections.
- B. RELATED SECTIONS
  - 1. Section 081113 Hollow Metal Doors and Frames: for door transoms, side lites and glazing in doors.
  - 2. Section 084113 Aluminum-Framed Entrances and Storefronts: for required insulated glazing for exterior use.

#### 1.02 SUMMARY

- A. Section Includes: Glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
  - 1. Doors and Transoms: Exterior requires insulated glazing.
  - 2. Entry Storefront glazing and Interior glazing for doors with side lites and transom as shown on drawings.
  - 3. Tempered translucent glass panel at locations shown on drawings.

#### 1.03 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit.

#### 1.04 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
  - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

#### 1.05 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass 12 inches square.

- C. Glazing Accessory Samples: For gaskets, sealants and colored spacers, in 12-inch lengths. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- D. Qualification Data: For installers.
- E. Product Certificates: For glass and glazing products, from manufacturer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulating glass, glazing sealants and glazing gaskets.
  - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- G. Warranties: Sample of special warranties.

#### 1.06 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- B. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- C. Source Limitations for Glass: Obtain laminated glass and insulating glass from single source from single manufacturer for each glass type.
- D. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.
- E. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
  - 1. NGA/GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
  - 2. FGIA/IGMA Publication for Insulating Glass: IGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- F. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- G. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.
- H. Strength: Do not substitute relative to designations of annealed, heat-strengthened, and fully tempered glass.
- I. Preinstallation Conference: Conduct conference at Project site.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review temporary protection requirements for glazing during and after installation.

#### 1.07 PRODUCT HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or

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other causes.

- B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

#### 1.08 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F.

#### 1.09 WARRANTY

- A. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
  - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
  - 1. Warranty Period: 10 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.01 GLASS PRODUCTS, GENERAL

- A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
  - 1. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
- B. Provide annealed, heat-strengthened, and fully tempered glass as specifically designated, without substitutions unless advance written permission is provided by the project Architect

#### 2.02 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Guardian Glass LLC; or comparable product by one of the following:
    - a. Guardian Glass LLC (Basis-of design product).
    - b. Pilkington North America.
    - c. Vitro Architectural Glass
- B. Fully Tempered Float Glass: ASTM C 1048; Kind FT,(clear) Low E unless otherwise indicated; of kind and condition indicated.

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- C. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion horizontally oriented after completion of field glazing unless Architect's advanced written approval is provided.
  - 1. For uncoated glass, comply with requirements for Condition A.
  - 2. For coated vision glass, comply with requirements for Condition C (other coated glass).
- D. Low-E-Coated Vision Glass: ASTM C1376, coated by vacuum deposition (sputter-coating) process, and complying with other requirements specified.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Guardian Glass LLC; SunGuard SN 68 on Clear and SN 68 on CrystalGray or comparable product by one of the following:
    - a. Guardian Glass LLC (Basis-of design product).
    - b. Pilkington North America.
    - c. Vitro Architectural Glass

### 2.03 LAMINATED GLASS

- A. Laminated Glass: ASTM C 1172, and complying with testing requirements in 16 CFR 1201 for Category II materials, and with other requirements specified. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
  - 1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written recommendations.
  - 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
  - 3. Interlayer Color: Clear.
- B. Glass: Comply with applicable requirements in "Glass Products" Article as indicated by descriptions in "Glass Types" Article.

### 2.04 INSULATING GLASS

- A. Manufacturers: Basis of Design; Guardian Industries Corp.; Sunguard Architectural Glass; Subject to compliance with requirements, provide products by one of the following:
  - 1. Guardian Glass LLC.
  - 2. Pilkington North America.
  - 3. PPG Industries, Inc.
- B. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190, and complying with other requirements specified.
  - 1. Sealing System: Dual seal, with manufacturer's standard polyisobutylene primary and silicone secondary.
  - 2. Spacer: Aluminum with mill or clear anodic finish.
  - 3. Desiccant: Molecular sieve or silica gel, or blend of both.
- C. Glass: Comply with applicable requirements in "Glass Products" Article and in "Laminated Glass" Article as indicated by descriptions in "Insulating-Glass Types" Article and in "Glass Types" Article.

## 2.05 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
  - 1. EPDM complying with ASTM C 864.
  - 2. Silicone complying with ASTM C 1115.
  - 3. Thermoplastic polyolefin rubber complying with ASTM C 1115.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned EPDM, silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.
  - 1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.

## 2.06 GLAZING SEALANTS

- A. General:
  - 1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
  - 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
  - 3. VOC Emissions for Sealants: Provide certificate of compliance with California Department of Public Health (CPDH) Standard Method v1.1- 2010, using the applicable exposure scenario.
  - 4. VOC Content for Sealants: Provide documentation of compliant VOC Content per SCAQMD Rule 1168.
  - 5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

## 2.07 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
  - 1. AAMA 804.3 tape, where indicated.
  - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
  - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## 2.08 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## 2.09 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

## 2.10 INTERIOR GLASS SCHEDULE

- A. Glass Type GL-1: Monolithic Laminated / Fully Tempered Glass / Heat Strengthened.  
Application: Interior Doors and Side Lights.
  - 1. Overall Thickness: 7/16 inch.
  - 2. Two plies of fully tempered / heat strengthened clear float glass.
  - 3. Basis-of-Design Product: Guardian Glass, LLC; Clear.
  - 4. Minimum Thickness of Each Glass Ply: 5 mm (3/16 inch).
  - 5. Interlayer Thickness: 0.060 inch PVB (1.52 mm).
- B. GL-1a
  - 1. Same as GL-1 with translucent interior laminated layer between glass plies
  - 2. Translucent Film for Restroom Requirement:
    - a. Must not allow vision into Restroom as determine by samples submitted to architect for seleapproval
    - b. Provide full range of screening for interior laminated layer.
- C. Monolithic Laminated Glass. Application:
  - 1. Glazing for Interior Doors and Vision Panels.
  - 2. Glazing for Interior Vestibule Aluminum Framed Doors, Transoms and Vision Panels (Side Lites).

## 2.11 EXTERIOR INSULATING-LAMINATED GLASS SCHEDULE

- A. Glass Type GL-2: Tinted, Low-E Coated Insulating laminated glass. Application: Glazing for Exterior Vestibule Aluminum Framed Doors and Transoms.

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1. Basis-of-Design Product: Guardian Glass LLC; SunGuard SN 68 on CrystalGray.
2. Overall Unit Thickness: 1 and 5/16 inch.
3. Outboard Lite: Guardian CrystalGray float glass.
  - a. Coating on #2 Surface: Guardian SunGuard SN 68.
  - b. Heat Treatment: Heat Strengthened.
4. Interspace: Air filled, 1/2 inch thick, hermetically sealed.
5. Inboard Lite: Guardian Clear laminated glass with two plies of annealed glass.
  - a. Thickness of Each Glass Ply: 1/4 inch (6 mm).
  - b. Interlayer Thickness: 0.090 inch; Clear SGP.
6. Provide safety glazing labeling
7. Safety glazing where required.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
  1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  2. Presence and functioning of weep systems.
  3. Minimum required face and edge clearances.
  4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.02 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

#### 3.03 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches.
  1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- L. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

### 3.04 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant if required to comply with performance requirements.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape, at locations where fixed stop is located on exterior.



### 3.05 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

### 3.06 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

### 3.07 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as

recommended in writing by glass manufacturer.

END OF SECTION 088100 08 8100

## SECTION 08 9110 LOUVERS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS:

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

#### 1.02 SECTION INCLUDES:

- A. Furnish and Install: Louvers.
- B. Related Sections:
  - 1. Section 079200 Joint Sealants
  - 2. Division 23 - Heating, Ventilating, and Air Conditioning
  - 3. Division 26 - Electrical
- C. Engineering by Contractor:
  - 1. Scope: Engineer all louvers including connections to building structure.
  - 2. Submittals: Calculations, shop fabrication drawings, field erection and installation drawings, details of connections.

#### 1.03 SUBMITTALS:

- A. Product Data: Manufacturer's data including instructions, recommendations, and restrictions.
- B. Verification Samples: 12 x 12 inches.

#### 1.04 DELIVERY, STORAGE, HANDLING:

- A. Comply with Division 1 General Requirements and manufacturer's instructions and recommendations.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS:

- A. Airline, Nystrom Building Products, [www.nystrom.com](http://www.nystrom.com)
- B. Airolite Company LLC, [www.airolite.com](http://www.airolite.com)
- C. Buckley [www.buckleyonline.com](http://www.buckleyonline.com)
- D. Construction Specialties, Inc., [www.c-sgroup.com](http://www.c-sgroup.com)
- E. Empire Ventilation Equipment Co., Inc., [www.empirevent.com](http://www.empirevent.com)
- F. Greenheck Fan Corporation, [www.greenheck.com](http://www.greenheck.com)
- G. Industrial Louvers Inc., [www.industriallouvers.com](http://www.industriallouvers.com)

H. Ruskin Company, [www.ruskin.com](http://www.ruskin.com)

## 2.02 LOUVERS:

A. Basis of Design: "RS-7315" Storm Resistant, Construction Specialties, Inc., [www.c-sgroup.com](http://www.c-sgroup.com)

B. Material: Extruded aluminum.

1. Blade Thickness: 0.068 inch.
2. Frame Thickness: 0.068 inch.

C. Assembly: Mechanically fastened with aluminum or alloy 304 stainless steel fasteners.

D. Mullions: Concealed from exterior.

## 2.03 LOUVER ACCESSORIES:

A. Clip Angles, Fasteners: Conceal from exterior view.

1. Clip Angles: 0.125 inch thick aluminum.
2. Fasteners: Alloy 304 stainless steel.

B. Bird Screens: Required for all louvers, but not louvers with insect screens.

1. Free Area: 80 percent.
2. Screen Fabric: 0.5 inch square mesh of 0.063 inch gage aluminum wire.
3. Frame: Formed aluminum.
4. Location: Inside face of louver.
5. Finish: Flat black.

C. Insect Screens: Required for all louvers not directly connected to duct work.

1. Free Area: 60 percent.
2. Screen Fabric: 18 x 14 mesh 0.0123 inch aluminum wire.
3. Frame: Formed aluminum.
4. Location: Inside face of louver.
5. Finish: Flat black.

D. Insulated Blank Off Plates:

1. Face Skins: 0.032 inch thick aluminum sheet on both sides of core.
2. Core: 1 inch thick, non combustible, semi-rigid, mineral fiber insulation.
3. Edges: Closed with aluminum channels.
4. Sizes: Custom for each louver and each condition.
5. Location: Inside face of louver to close all unused louver area.
6. Finish of Surfaces Visible From Exterior: Flat black.

E. Sill Flashing Pan: 0.050 inch aluminum, formed into seamless, welded seam, three sided pans with hemmed drip edge.

## 2.04 LOUVER FABRICATION:

A. Shop fabricate louvers.

B. Fabricate louvers straight, plumb, level, and square with uniform, tight joints.

C. Maintain equal blade spacing from blade to blade and from blade to frame.

D. Provide 0.75 inch deep sealant adhesion legs at entire perimeter of each louver.

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LOUVERS

- E. Visible Metal Finish: Architect to select from manufacturer's standard color chart for Powder Coat and Kynar Finishes.

2.05 JOINT SEALANTS:

- A. Comply with Section 079200 Joint Sealants.

2.06 GALVANIC ISOLATION TAPE:

- A. 7 mils thick, UV resistant, water resistant, vinyl electrical tape.
- B. Basis of Design: "Scotch Super 33+ Vinyl Electrical Tape", 3M Corporation [www.3m.com](http://www.3m.com)

PART 3 - EXECUTION

3.01 LOUVERS INSTALLATION:

- A. Comply with manufacturer's instructions and recommendations.
- B. Comply with approved, engineered installation drawings.
- C. Install plumb, level, square, and in alignment with exterior wall plane.
- D. Conceal clip angles and fasteners from exterior view.
- E. Attach louver to building structure: structural steel, light gage steel framing, or structural masonry.
  - 1. Do not attach to building veneer systems including, without limitation, masonry veneer.
- F. Coordinate installation with flashings built into walls.
- G. Isolate louver from direct contact with masonry, concrete, and dissimilar metals.
- H. Install screens.
- I. Restore damaged finishes to eliminate all evidence of repair.

3.02 ADDITIONAL REQUIREMENTS FOR SILL FLASHING PANS:

- A. Collect, control, and drain water which enters through the louver.
- B. Provide custom fabricated sill flashing pans continuously under louver sills.
- C. Pitch flashing pan 10 degrees toward the exterior of building.
  - 1. Continuously frame or grout under flashing pan to form pitch.
- D. Provide seamless flashing pans up to 9 feet sill length.
  - 1. For over 9 feet sill length, multiple pans are allowed, but minimize seams.
  - 2. Overlap seams at least three inches.
  - 3. Provide two continuous beads of concealed silicone sealant in each overlapped seam.
  - 4. Cover seam with 6 inch wide strip of 40 mil thick, rubberized asphalt flashing.
  - 5. Do not expose flexible flashing strip to view or sunlight in the completed installation.
- E. Fabricate flashing pan from = 0.032 inch aluminum.

- F. Form three sided pans with = 2.0 inches high up turned edges.
  - G. Fold and hem pan edges.
  - H. Provide permanently waterproof, folded pan corners.
    - 1. Do not provide sealant sealed corners.
  - I. Terminate flashing pan exterior edge as shown or, if not shown, flush with exterior face of louver sill with hemmed drip.
  - J. Extend flashing pan interior edge as shown or, if not shown, 12 inches inside louver sill.
  - K. Support interior projecting pan with aluminum supports spaced = 16 inches on center.
    - 1. Do not mechanically fasten pan to aluminum supports.
    - 2. Adhere pan to aluminum supports or mechanically fold pan edge to aluminum supports.
  - L. Do not fasten through or penetrate sill flashing pan at any location.
- 3.03 ADDITIONAL REQUIREMENTS FOR DUCT CONNECTIONS:
- A. For louvers intended to be connected to building ductwork:
    - 1. Coordinate louvers with building duct work.
    - 2. Provide sheet metal transitions to connect louvers to building duct work.
    - 3. Fabricate sheet metal transitions to match building duct work in size, material, insulation, fabrication, quality.
- 3.04 ADDITIONAL REQUIREMENTS FOR BLANK OFF PLATES:
- A. Coordinate installation with building duct work and related work, if any.
  - B. Accurately cut and fit blank off plates to accommodate all connected ducts and penetrations.
  - C. Extend blank-off plates over 100 percent of interior louver areas not used for ventilation.
  - D. Orient black painted face of blank off plate toward louver blades.
  - E. Provide continuous glazing tape between blank off plate and louver interior frame.
  - F. Make waterproof and air tight seals between blank off plates and interior louver frame.
  - G. Mechanically attach blank off plates with sheet metal screws.
  - H. Locate sheet metal screws within 3 inches of corners and not over 8 inches in between.

END OF SECTION 08 9110

SECTION 09 0561  
COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Related Sections:
  - 1. Section 033000 - Cast-in-Place Concrete.
  - 2. Section 093000 - Tiling.
  - 3. Section 096200 - Resinous Poured In Place Resilient Flooring.
  - 4. Section 096500 - Resilient Flooring.

1.02 SECTION INCLUDES

- A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
  - 1. Resilient tile and sheet.
  - 2. Thin-set ceramic tile and stone tile.
  - 3. Resinous poured in place resilient flooring.
- B. Patching compound.
- C. Remedial floor coatings.

1.03 REFERENCE STANDARDS

- A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2016a.
- B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2014).
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2019.
- D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016a.
- E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

## 1.05 SUBMITTALS

- A. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
  - 1. Moisture and alkalinity (pH) limits and test methods.
  - 2. Manufacturer's required bond/compatibility test procedure.
- B. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
  - 1. Manufacturer's qualification statement.
  - 2. Manufacturer's statement of compatibility with types of flooring applied over remedial product.
  - 3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
  - 4. Manufacturer's installation instructions.
  - 5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.
- C. Adhesive Bond and Compatibility Test Report.
- D. Floor Moisture Testing Technician Certificate: International Concrete Repair Institute (ICRI) Concrete Slab Moisture Testing Technician- Grade I certificate.

## 1.06 QUALITY ASSURANCE

- A. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

## 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

## PART 2 PRODUCTS

### 2.01 MATERIALS

- A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
  - 1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
  - 2. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.
  - 3. Products:

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COMMON WORK RESULTS FOR FLOORING PREPARATION



- a. TEC, an H.B. Fuller Construction Products Brand; TEC Feather Edge Skim Coat: [www.tecspecialty.com/#sle](http://www.tecspecialty.com/#sle).
  - b. Substitutions: See Section 012500 "Substitution Procedures"
- B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.
- C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
- 1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
  - 2. Use product recommended by testing agency.

### PART 3 EXECUTION

#### 3.01 CONCRETE SLAB PREPARATION

- A. Perform following operations in the order indicated:
- 1. Preliminary cleaning.
  - 2. Specified remediation, if required.
  - 3. Patching, smoothing, and leveling, as required.
  - 4. Other preparation specified.
  - 5. Adhesive bond and compatibility test.
  - 6. Protection.
- B. Remediations:
- 1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
  - 2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
  - 3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

#### 3.02 MOISTURE VAPOR EMISSION TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F1869 and as follows.
- D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
- F. Report: Report the information required by the test method.

### 3.03 ALKALINITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

### 3.04 PREPARATION

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with requirements and recommendations of floor covering manufacturer.
- C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- D. Do not fill expansion joints, isolation joints, or other moving joints.

### 3.05 ADHESIVE BOND AND COMPATIBILITY TESTING

- A. Comply with requirements and recommendations of floor covering manufacturer.

### 3.06 APPLICATION OF REMEDIAL FLOOR COATING

- A. Comply with requirements and recommendations of coating manufacturer.

### 3.07 INSTALLATION OF REMEDIAL FLOOR SHEET MEMBRANE

- A. Install in accordance with sheet membrane manufacturer's instructions.

### 3.08 PROTECTION

- A. Cover prepared floors with building paper or other durable covering.

END OF SECTION 090561 09 0561

SECTION 09 2216  
NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Metal partition, ceiling, and soffit framing.
- B. Framing accessories.

1.02 RELATED REQUIREMENTS

- A. Section 05 4000 - Cold-Formed Metal Framing: Execution requirements for anchors for attaching work of this section.
- B. Section 05 5000 - Metal Fabrications: Metal fabrications attached to stud framing.
- C. Section 05 5000 - Metal Fabrications: Execution requirements for anchors for attaching work of this section.
- D. Section 06 1000 - Rough Carpentry: Wood blocking within stud framing.
- E. Section 06 1000 - Rough Carpentry: Wall sheathing.
- F. Section 07 2100 - Thermal Insulation: Acoustic insulation.
- G. Section 07 8400 - Firestopping: Sealing top-of-wall assemblies at fire-resistance-rated walls.
- H. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- I. Section 08 3100 - Access Doors and Panels.
- J. Section 09 2500-Gypsum Board: Execution requirements for anchors for attaching work of this section.
- K. Section 09 2500-Gypsum Board: Execution requirements for shaft wall framing, anchors for attaching work of this section.

1.03 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members 2016, with Supplement (2020).
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.
- D. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members 2015.
- E. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members 2018.

- F. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2017.
- G. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.
- H. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2022.
- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
- J. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop Drawings:
  1. Indicate prefabricated work, component details, stud layout, framed openings, anchorage to structure, acoustic details, type and location of fasteners, accessories, and items of other related work.
  2. Describe method for securing studs to tracks, splicing, and for blocking and reinforcement of framing connections.
- C. Product Data: Provide data describing framing member materials and finish, product criteria, load charts, and limitations.
- D. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- E. SSFSA Manufacturer Qualification: Submit documentation of manufacturer association membership.
- F. SSMA Manufacturer Qualification: Submit documentation of manufacturer association membership.

#### 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.

#### 1.06 MOCK-UP

- A. Provide mock-up of stud wall, ceiling, and soffit framing including insulation, sheathing, window frame, and door frame and finish specified in other sections. Coordinate with installation of associated work specified in other sections.
  1. Mock-up may remain as part of the Work.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Metal Framing, Connectors, and Accessories:

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NON-STRUCTURAL METAL FRAMING

1. CEMCO: [www.cemcosteel.com/#sle](http://www.cemcosteel.com/#sle).
2. ClarkDietrich: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
3. Jaimes Industries: [www.jaimesind.com/#sle](http://www.jaimesind.com/#sle).
4. Marino: [www.marinoware.com/#sle](http://www.marinoware.com/#sle).
5. R-stud, LLC: [www.rstud.com/#sle](http://www.rstud.com/#sle).
6. SCAFCO Corporation: [www.scafco.com/#sle](http://www.scafco.com/#sle).
7. Simpson Strong Tie: [www.strongtie.com/#sle](http://www.strongtie.com/#sle).
8. Steel Construction Systems: [www.steelconsystems.com/#sle](http://www.steelconsystems.com/#sle).
9. Super Stud Building Products, Inc: [www.buysuperstud.com/#sle](http://www.buysuperstud.com/#sle).
10. The Steel Network, Inc: [www.SteelNetwork.com/#sle](http://www.SteelNetwork.com/#sle).

## 2.02 FRAMING MATERIALS

- A. Fire-Resistance-Rated Assemblies: Comply with applicable code and as follows:
  1. Fire-Resistance-Rated shaft wall elevator Ceiling : Listed assembly by UL, No. (as indicated on drawings); 2 hour rating.
- B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.
  1. Studs: C shaped with knurled or embossed faces.
    - a. Products:
      - 1) MBA Building Supplies; ProSTUD: [www.mbastuds.com/#sle](http://www.mbastuds.com/#sle).
      - 2) Super Stud Building Products, Inc; The EDGE: [www.buysuperstud.com/#sle](http://www.buysuperstud.com/#sle).
  2. Paired Studs for Sound-Rated Assemblies: Engineered single-piece assemblies comprised of paired studs coupled by sound isolators, designed to replace conventional side-by-side, parallel, double-wall partition framing.
    - a. Widths: As indicated on drawings.
    - b. Products:
      - 1) SCAFCO Corporation; SoundGuard Silent Steel Framing System: [www.scafco.com/#sle](http://www.scafco.com/#sle).
  3. Runners: U shaped, sized to match studs.
  4. Ceiling Channels: C shaped.
  5. Resilient Furring Channels: Single or double leg configuration; 1/2 inch channel depth.
    - a. Products:
      - 1) ClarkDietrich; RC Deluxe Resilient Channel: [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
  6. Resilient Sound Isolation Clips: Steel resilient clips with molded rubber isolators, attaches to framing; improves noise isolation for areas between gypsum board assemblies and adjacent sources of noise.
    - a. Products:
      - 1) ClarkDietrich; Sound Clip (CDSC): [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
      - 2) Pliteq, Inc; GenieClip RST: [www.pliteq.com/#sle](http://www.pliteq.com/#sle).
- C. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws, and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
  1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
  2. Material: ASTM A653/A653M steel sheet, SS Grade 50, with G60/Z180 hot-dipped galvanized coating.
  3. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.

- D. Non-Loadbearing Framing Accessories:
1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
  2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.
    - a. Materials: ASTM A36/A36M formed sheet steel support member with factory-welded ASTM A1003/A1003M steel plate base.
    - b. Height: 35-3/4 inches.
    - c. Products:
      - 1) ClarkDietrich; Pony Wall (PW): [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
  3. Framing Connectors: ASTM A653/A653M G90 galvanized steel clips; secures cold rolled channel to wall studs for lateral bracing.
    - a. Products:
      - 1) ClarkDietrich; FastBridge Clip (FB33): [www.clarkdietrich.com/#sle](http://www.clarkdietrich.com/#sle).
  4. Shaft wall fire rated assembly framing in accordance with UL assembly refer to drawings and GWB section for further requirements.
    - a. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements including minimum installation requirements.
    - b. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
  5. Flexible Wood Backing: Fire-retardant-treated wood with sheet steel connectors.
  6. Sheet Metal Backing: 0.036 inch thick, galvanized.
  7. Fasteners: ASTM C1002 self-piercing tapping screws.
  8. Anchorage Devices: Powder actuated.
  9. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: 3 inch ( 75 mm).
  10. Acoustic Insulation: As specified in Section 07 2100.
  11. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic.
- E. Sound Isolation Tape: Elastomeric foam tape for sound decoupling.
1. Surface Burning Characteristics: Provide assemblies with flame spread index of 75 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
  2. Tape Thickness: 1/4 inch.

## 2.03 FABRICATION

- A. Fabricate assemblies of framed sections to sizes and profiles required.
- B. Fit, reinforce, and brace framing members to suit design requirements.
- C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that rough-in utilities are in proper location.

### 3.02 INSTALLATION OF STUD FRAMING

- A. Comply with requirements of ASTM C754.
- B. Extend partition framing to structure where indicated and to ceiling in other locations.
- C. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
- D. Align and secure top and bottom runners at 24 inches on center.
- E. Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- F. Align stud web openings horizontally.
- G. Secure studs to tracks using crimping method. Do not weld.
- H. Stud splicing is not permissible.
- I. Fabricate corners using a minimum of three studs.
- J. Install double studs at wall openings, door and window jambs, not more than 2 inches from each side of openings.
- K. Brace stud framing system rigid.
- L. Coordinate erection of studs with requirements of door frames; install supports and attachments.
- M. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
- N. Blocking: Use wood blocking secured to studs. Provide blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, and opening frames.
- O. Sound Isolation Clips: Mechanically attach to framing or structure with fasteners recommended by clip manufacturer. Install at spacing indicated on drawings.
- P. Furring: Coordinate with sound isolation clip spacing and locations. Lap splices a minimum of 6 inches.
- Q. Use sheet metal backing for reinforcement of casework and behind other wall mounted items.
- R. Refer to GWB Section for Shaft wall execution requirements.

### 3.03 CEILING AND SOFFIT FRAMING

- A. Comply with requirements of ASTM C754.
- B. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
- C. Install furring independent of walls, columns, and above-ceiling work.
- D. Securely anchor hangers to structural members or embed them in structural slab. Space hangers as required to limit deflection to criteria indicated. Use rigid hangers at exterior soffits.

- E. Space main carrying channels at maximum 72 inch on center, and not more than 6 inches from wall surfaces. Lap splice securely.
- F. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
- G. Place furring channels perpendicular to carrying channels, not more than 2 inches from perimeter walls, and rigidly secure. Lap splices securely.
- H. Reinforce openings in suspension system that interrupt main carrying channels or furring channels with lateral channel bracing. Extend bracing minimum 24 inches past each opening.

3.04 TOLERANCES

- A. Maximum Variation From True Position: 1/8 inch in 10 feet.
- B. Maximum Variation From Plumb: 1/8 inch in 10 feet.

END OF SECTION 09 2216



## SECTION 09 2300 GYPSUM PLASTERING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Gypsum plastering.
- B. Gypsum lath.
- C. Repair of Existing Plaster and Lath to Industry Standards and provided in this section.
  - 1. ASTM C1063-22
  - 2. Industry Best Practice and Requirements of Manufacturer.
  - 3. Historic requirements in Division 1.
- D. Restoration: The work required includes finish restoration of original surfaces to the greatest degree possible, while complying with current codes and construction limitations.
  - 1. The contractor is to provide all necessary systems and materials as required to produce the intended finishes.
  - 2. Where current codes cannot be complied with, and/or construction limitations (including deterioration of existing substrate) are such that the intended finish cannot be achieved, notify the architect for clarification and/or decision prior to proceeding with the work.

#### 1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood stud framing for plaster.
- B. Section 07 8400 - Firestopping: Sealing top-of-wall assemblies and through-wall penetrations at fire rated walls.
- C. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
- D. Section 09 2500 - Gypsum Board: Misc items.
- E. Section 09 2216 - Non-Structural Metal Framing: Metal stud framing and furring for plaster.
- F. Section 09 2400 - Cement Plastering.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process 2022a.
- B. ASTM C28/C28M - Standard Specification for Gypsum Plasters 2010 (Reapproved 2020).
- C. ASTM C35 - Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster 2001 (Reapproved 2019).
- D. ASTM C61/C61M - Standard Specification for Gypsum Keene's Cement 2000 (Reapproved 2020).
- E. ASTM C206 - Standard Specification for Finishing Hydrated Lime 2014 (Reapproved 2022).

- F. ASTM C631 - Standard Specification for Bonding Compounds for Interior Gypsum Plastering 2009 (Reapproved 2020).
- G. ASTM C841 - Standard Specification for Installation of Interior Lathing and Furring 2003 (Reapproved 2018).
- H. ASTM C842 - Standard Specification for Application of Interior Gypsum Plaster 2005 (Reapproved 2021).
- I. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.
- J. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittals procedures.
- B. Product Data: Provide data on plaster materials, characteristics, and limitations of products specified.

#### 1.05 QUALITY ASSURANCE

- A. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

#### 1.06 MOCK-UP

- A. Repair an area of existing plaster and have work reviewed to establish standard of care for remaining repairs.
- B. Locate where directed.
- C. Mock-up may remain as part of the Work.

#### 1.07 FIELD CONDITIONS

- A. Do not apply plaster when substrate or ambient air temperature is under 50 degrees F or over 80 degrees F.
- B. Maintain minimum ambient temperature of 50 degrees F during and after installation of plaster.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Gypsum Plaster:
  1. National Gypsum Company: [www.nationalgypsum.com/#sle](http://www.nationalgypsum.com/#sle).
  2. USG: [www.usg.com/#sle](http://www.usg.com/#sle).

#### 2.02 GYPSUM PLASTER ASSEMBLIES

- A. Existing Plaster wall repair

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GYPSUM PLASTERING

## 2.03 PLASTER MATERIALS

- A. Gypsum Neat Plaster: ASTM C28/C28M; fibered.
- B. Ready-Mixed Gypsum Plaster: ASTM C28/C28M; mill-mixed type, requiring only the addition of water.
- C. Wood-Fibered Gypsum Plaster: ASTM C28/C28M.
- D. Gypsum Keene's Cement: ASTM C61/C61M.
- E. Lime: ASTM C206, Type S; special finishing hydrated lime.
- F. Aggregate for Base Coats: ASTM C35; sand and lightweight aggregates.
- G. Ready-Mixed Finishing Plaster: Gypsum/Lime putty type, ASTM C28/C28M; mixture of gauging plaster and lime.
- H. Ready-Mixed Finishing Plaster: Keene's cement/lime putty type; ASTM C61/C61M and ASTM C206.
- I. Ready-Mixed Finishing Plaster: Sand float type; ASTM C28/C28M and ASTM C35 prepared mixture of gypsum plaster and sand.
- J. Aggregate for Finish Coats: As specified in ASTM C842.
- K. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.
- L. Bonding Agent: ASTM C631 Type recommended for bonding plaster to monolithic concrete surfaces.

## 2.04 LATH AND ACCESSORIES

- A. Metal Lath and Accessories: As specified in Section 09 2236.
- B. Gypsum Lath: ASTM C1396/C1396M, standard type.
  - 1. Thickness: 3/8 inch.
- C. Finishing Accessories: ASTM C841, extruded aluminum alloy (6063 T5), galvanized steel sheet ASTM A924/A924M G90, galvanized steel wire, or rolled zinc, unless noted otherwise.
  - 1. Types: As detailed or required for finished appearance.
  - 2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed plaster edges.
  - 3. Products:
    - a. Same manufacturer as framing materials.
- D. Beads, Screeds, Joint Accessories, and Other Trim: Depth governed by plaster thickness, maximum possible lengths.
  - 1. Material: PVC, open grid flanges or perforated with nailing holes.
  - 2. Casing Beads: Square edges.
  - 3. Corner Beads: Radiused corners.
  - 4. Base Screeds: Bevelled edges.
  - 5. Expansion Joints: Accordion profile with factory-installed protective tape, 2 inch wide flanges.

## 2.05 PLASTER MIXES

- A. Over Gypsum Lath: Two-coat application, ready-mixed plaster, mixed and proportioned in accordance with ASTM C842 and manufacturer's instructions.
- B. Ready-Mixed Plaster Materials: Mix in accordance with manufacturer's instructions.
- C. Finish Coat for Troweled Finish: Lime putty with gypsum gauging plaster, mixed and proportioned in accordance with ASTM C842.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that existing conditions are satisfactory before starting work.
- B. Masonry: Verify joints are cut flush and surface is ready to receive work of this section. Verify no bituminous or water repellent coatings exist on masonry surface.
- C. Concrete: Verify surfaces are flat, honeycomb is filled flush, and surface is ready to receive work of this section. Verify no bituminous, water repellent, or form release agents exist on concrete surface that are detrimental to plaster or plaster bond.
- D. Grounds and Blocking: Verify items within walls for other sections of work have been installed.
- E. Gypsum Lath and Accessories: Verify substrate is flat and surface is ready to receive work of this section. Verify joint and surface perimeter accessories are in place.
- F. Mechanical and Electrical: Verify services within walls have been tested and approved.

### 3.02 PREPARATION

- A. Dampen masonry surfaces to reduce excessive suction.
- B. Clean concrete surfaces of foreign matter. Thoroughly dampen surfaces before using acid solutions, solvent, or detergents to perform cleaning. Wash surface with clean water.
- C. Roughen smooth concrete surfaces and smooth faced masonry.
- D. Apply bonding agent in accordance with manufacturer's instructions.

### 3.03 INSTALLATION - GYPSUM LATH AND ACCESSORIES

- A. Install gypsum lath in accordance with ASTM C841.
- B. Install gypsum lath perpendicular to framing members, with lath face exposed. Stagger end joint of alternate courses. Butt joints tight. Maximum gap allowed: 1/8 inch.
- C. Place corner reinforcement diagonally over gypsum lath and across corner immediately above and below openings. Secure to gypsum lath only.
- D. Continuously reinforce internal angles with corner mesh, return 3 inches from corner to form the angle reinforcement; fasten at perimeter edges only.
- E. Place corner bead at external wall corners; fasten at outer edges of lath only.

- F. Place strip mesh diagonally at corners of lathed openings. Secure rigidly in place.
- G. Place 4 inch wide strips of strip mesh centered over junctions of dissimilar backing materials. Secure rigidly in place.
- H. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.
- I. Control and Expansion Joints:
  - 1. Locate at 20 feet on center.
  - 2. Locate as indicated.
  - 3. Use two casing beads spaced 1/4 inch apart to form joint.
- J. Coordinate installation of frames plumb and level in opening.

### 3.04 PLASTERING

- A. Apply gypsum plaster in accordance with ASTM C842 and manufacturer's instructions.
- B. Thickness of Plaster including Finish Coat:
  - 1. Over metal lath: 5/8 inch.
  - 2. Over gypsum lath: 1/2 inch.
  - 3. Direct to unit masonry: 5/8 inch.
  - 4. Finish coat applied direct to concrete: 3/16 inch, maximum.
  - 5. To vertical concrete surfaces: 5/8 inch.
  - 6. To horizontal concrete surfaces: 1/8 to 3/8 inch.
- C. Apply color tinted finish coat to prepared surfaces within \_\_\_\_ hours of plaster application. Apply in accordance with manufacturer's instructions.
- D. Finish Texture: Float to a consistent and smooth finish.
- E. Perform work in panels to nearest natural break or between accessories.

### 3.05 TOLERANCES

- A. Maximum Variation from True Flatness: 1/8 inch in 10 feet.
- END OF SECTION 09 2300**

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## SECTION 09 2400 CEMENT PLASTERING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Cement Plastering.
- B. Repair of Existing Cement Plaster and substrate to Industry Standards and provided in this section.
  - 1. Portland Cement Plaster/Stucco Manual, EB049
  - 2. Repair of Portland Cement/Stucco, IS526
  - 3. ASTM Standards [www.astm.org](http://www.astm.org):
  - 4. ASTM C 926, Standard Specification for Application of Portland Cement-Based Plaster
  - 5. ASTM C 1063, Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster

#### 1.02 RELATED REQUIREMENTS

- A. Section 05 4000 - Cold-Formed Metal Framing: Structural metal framing for plaster.
- B. Section 06 1000 - Rough Carpentry: Wood stud framing for plaster.
- C. Section 07 8400 - Firestopping: Sealing top-of-wall assemblies and through-wall penetrations at fire rated walls.
- D. Section 08 3100 - Access Doors and Panels: Access panels.
- E. Section 09 2216 Non-Structural Metal Framing: Metal stud framing and furring for plaster.
- F. Section 09 2500 - Gypsum Board: Acoustical sealing in conjunction with metal stud framing and furring for plaster.
- G. Section 09 2236 - Lath: Lath, furring, beads, screeds, and joint accessories for plaster base.
- H. Section 09 9113 - Exterior Painting.
- I. Section 09 9123 - Interior Painting.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire 2019.
- B. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process 2022a.
- C. ASTM C91/C91M - Standard Specification for Masonry Cement 2023.
- D. ASTM C150/C150M - Standard Specification for Portland Cement 2022.
- E. ASTM C206 - Standard Specification for Finishing Hydrated Lime 2014 (Reapproved 2022).
- F. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes 2018.

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- G. ASTM C897 - Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters 2015 (Reapproved 2020).
- H. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster 2023.
- I. ASTM C932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering 2006 (Reapproved 2019).
- J. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster 2022a.
- K. ASTM C1328/C1328M - Standard Specification for Plastic (Stucco) Cement 2023.
- L. ASTM C933 - Standard Specification for Welded Wire Lath 2018.
- M. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
- N. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2022.
- O. FM (AG) - FM Approval Guide Current Edition.
- P. ICC (IBC) - International Building Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- Q. ICC (IRC) - International Residential Code for One- and Two-Family Dwellings Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- R. ITS (DIR) - Directory of Listed Products Current Edition.
- S. NTMA (SPECS) - NTMA Terrazzo Specifications Current Edition.
- T. UL (DIR) - Online Certifications Directory Current Edition.
- U. UL (FRD) - Fire Resistance Directory Current Edition.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittals procedures.
- B. Product Data: Provide data on plaster materials and trim accessories.

#### 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

#### 1.06 MOCK-UP

- A. Repair an area of existing cement plaster and have work reviewed to establish standard of care for remaining repairs.
  - 1. Locate where directed.
  - 2. Mock-up may remain as part of this work.



## 1.07 FIELD CONDITIONS

- A. Exterior Plaster Work: Do not apply plaster when substrate or ambient air temperature is 40 degrees F or lower, or when temperature is expected to drop below 40 degrees F within 48 hours of application.
- B. Interior Plaster Work: Maintain minimum ambient temperature of 50 degrees F during installation of plaster and until fully cured.

## PART 2 PRODUCTS

### 2.01 CEMENT PLASTER APPLICATIONS

- A. Lath Plaster Base: Metal lath.
  - 1. Plaster Type: Factory prepared plaster mix.
  - 2. Number of Coats: Three.
  - 3. First Coat: Apply to a nominal thickness of 3/8 inch.
  - 4. Second Coat: Apply to a nominal thickness of 3/8 inch.
  - 5. Leveling Coat: Apply to a nominal thickness of 1/32 to 1/16 inch.
  - 6. Finish Coat: Apply to a nominal thickness of 1/8 inch.
- B. Solid Plaster Base: Concrete masonry.
  - 1. Plaster Type: Jobsite mixed plaster.
  - 2. Number of Coats: Three.
  - 3. First Coat: Apply to a nominal thickness of 1/4 inch.
  - 4. Second Coat: Apply to a nominal thickness of 1/4 inch.
  - 5. Leveling Coat: Apply to a nominal thickness of 1/32 to 1/16 inch.
  - 6. Finish Coat: Apply to a nominal thickness of 1/8 inch.

### 2.02 FACTORY PREPARED CEMENT PLASTER

- A. Fire-Resistance Rating: Determined in accordance with test procedures in ASTM E119 and complying with the following:
  - 1. ICC (IBC).
- B. Premixed One-Coat Base: Mixture of Type I Portland cement complying with ASTM C150/C150M, hydrated lime complying with ASTM C207, fibers and other approved ingredients; install in accordance with ASTM C926.
  - 1. Manufacturers:
    - a. Magna Wall, an Oldcastle brand; Magna Wall Fiber Reinforced One Coat Stucco: [www.magnawall.com/#sle](http://www.magnawall.com/#sle).
    - b. The QUIKRETE Companies: [www.quikrete.com/#sle](http://www.quikrete.com/#sle).
- C. Premixed Leveling Coat: Acrylic polymer-based blend approved for use with plaster manufacturer's base coat and finish materials.
- D. Premixed Textured Coating: Polymer modified acrylic coating, integrally colored, and trowel applied to substrates prepared in accordance with manufacturer's written installation instructions.
  - 1. Color: As indicated on drawings.
  - 2. Manufacturers:
    - a. Parex USA Inc; AquaSol Swirl Fine: [www.parex.com/#sle](http://www.parex.com/#sle).

- b. Parex USA Inc; Optimum DPR Swirl Fine: [www.parex.com/#sle](http://www.parex.com/#sle).
- c. Sto Corp; Powerflex Fine: [www.stocorp.com/#sle](http://www.stocorp.com/#sle).
- d. Sto Corp; Powerwall Freeform: [www.stocorp.com/#sle](http://www.stocorp.com/#sle).

## 2.03 JOBSITE MIXED CEMENT PLASTER

- A. Fire Resistance Rating: Determined in accordance with test procedures in ASTM E119 and complying with:
  - 1. ICC (IBC), Section .
- B. Materials:
  - 1. Sand: Clean, well graded, and complying with ASTM C897.
  - 2. Water: Clean, fresh, potable, and free of mineral or organic matter that could adversely affect plaster.
- C. Plaster Mixes: Proportioned in accordance with ASTM C926; parts by volume.
  - 1. First Coat Over Lath:
    - a. Minimum 2-1/2 parts and maximum 4 parts sand, per total volume of cementitious materials.
    - b. Provide fiber reinforcement at 1-1/2 lbs per sack of cement.
  - 2. First Coat Over High Absorption Solid Base:
    - a. Minimum 2-1/2 parts and maximum 4 parts sand, per total volume of cementitious materials.
    - b. Fiber reinforcement at 1-1/2 lbs per sack of cement.
  - 3. Dash Bond Coat: One part Portland cement, with maximum 2 parts sand.
  - 4. First Coat Over Low Absorption Solid Base:
    - a. Minimum 2-1/2 parts and maximum 4 parts sand, per total volume of cementitious materials.
  - 5. Second Coat: Same mixture as first coat, without fiber reinforcement, except minimum 3 parts and maximum 5 parts sand.
  - 6. Finish Coat:
    - a. Minimum 1-1/2 parts and maximum 3 parts sand, per total volume of cementitious materials.

## 2.04 ACCESSORIES

- A. Lath:
  - 1. Wire Size: 17 gauge, 0.453 inch.
  - 2. Galvanized: ASTM A641/A641M.
  - 3. Opening Size: 1-1/2 by 1-1/2 inches.
  - 4. Comply with ASTM C933.
  - 5. Products:
    - a. Structa Wire Corp; Megalath: [www.structawire.com/#sle](http://www.structawire.com/#sle).
- B. Finishing Accessories: ASTM C1063; extruded aluminum alloy (6063 T5), galvanizd steel sheet ASTM A924/A924M G90, rolled zinc, or rigid plastic, unless noted otherwise.
  - 1. Types: As detailed or required for finished appearance.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions are acceptable prior to starting this work.

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- B. Verify masonry joints are flush and surfaces are ready to receive work of this section, and that there are no existing bituminous or water repellent coatings on masonry surfaces.
- C. Verify concrete surfaces are flat, honeycombs are filled flush, and surfaces are ready to receive work of this section, and that there are no existing bituminous, water repellent, or form release agent coatings on concrete surfaces that may be detrimental to plaster bond.
- D. Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are properly in place.
- E. Verify mechanical and electrical equipment and services located within areas to receive this work have been properly tested and approved.

### 3.02 PREPARATION

- A. Dampen masonry surfaces to reduce excessive suction.
- B. Clean concrete surfaces of foreign matter using approved acid solutions, solvents, or detergents, and then rinse surfaces thoroughly with clean water.
- C. Apply dash bond coat of plaster to solid bases and moist cure for at least 24 hours before applying first coat of jobsite mixed plaster.

### 3.03 INSTALLATION - WATER-RESISTIVE BARRIER

- A. Where cement plaster is installed as part of a barrier wall system, install two layers of water-resistive barrier in accordance with water-resistive barrier manufacturer's instructions.
- B. Integrate water-resistive barrier with flashing accessories, and adjacent doors, windows, penetrations, and cladding transitions.
- C. Lap water-resistive barrier at least 6 inches at vertical joints.
- D. Lap water-resistive barrier at least 16 inches beyond vertical line of inside and outside corners in both directions.
- E. For two layer applications, start with two horizontal layers at bottom of exterior wall or structure.

### 3.04 INSTALLATION - RAINSCREEN DRAINAGE MATERIAL

- A. Install rainscreen drainage material and metal lath with accessories over sheathing material and water-resistive barrier with fastening system in accordance with ASTM C1063 into wood or metal studs. Install drainage material with filter fabric mortar screen to exterior.

### 3.05 Mixing

- A. Mix only as much plaster as can be used prior to initial set.
- B. Mix materials dry, to uniform color and consistency, before adding water.
- C. Add air entrainment admixtures to each coat to provide 5 to 7 percent air entrainment.
- D. Do not retemper mixes after initial set has occurred.
- E. Protect mixtures from frost or freezing temperatures, contamination, and excessive evaporation.

3.06 APPLICATION

- A. Apply plaster in accordance with manufacturer's written instructions and comply with ASTM C926.
- B. Base Coats:
  - 1. Apply base coat(s) to fully embed lath and to specified thickness.
  - 2. Follow guidelines in ASTM C926 and manufacturer's written installation instructions for moist curing base coats and application of subsequent coats.
- C. Leveling Coat:
  - 1. Apply leveling coat to specified thickness.
- D. Finish Coats:
  - 1. Cement Plaster:
    - a. Apply with sufficient material and pressure to ensure complete coverage of base to specified thickness.
    - b. Apply desired surface texture while mix is still workable.
    - c. Float to a consistent finish.

3.07 REPAIR

- A. Patching: Remove loose, damaged or defective plaster and replace with plaster of same composition; finish to match surrounding area.

END OF SECTION 09 2400

## SECTION 09 2500 GYPSUM BOARD

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

#### 1.02 SUMMARY

##### A. Section Includes:

1. Interior high impact 5/8" gypsum board for all exposed walls and gypsum board ceilings.
  - a. Provide Type X and as required by UL rating for all fire rated assemblies.
2. Interior 5/8" gypsum board ceilings where 1/2" plywood substrate is called out on drawings; note all non high impact GWB must have 1/2" Fire Retardant plywood substrate.
3. Exterior glass fiber gypsum board for exterior roof sheathing as shown in roof details.
4. Interior heavy duty 5/8" gypsum glassfiber tile back board for wall tile substrate.
5. Drywall trims and accessories; typical and as shown on drawings.
6. Complete acoustical and fire rated shaft wall assembly for top of elevator shaft and control room enclosure complying with UL assembly and fire rating shown on drawings.
7. GWB in janitor closets, toilet rooms and kitchen areas to be moisture and mold resistant.
  - a. In public restrooms GWB will also be required to be high impact.

##### B. Related Sections:

1. Section 05 4000 - Cold-Formed Metal Framing: Structural steel stud framing, ceiling joist framing and applicable shaft wall framing.
2. Section 06 1000 - Rough Carpentry: roof sheathing, wood stud framing for patching / extending existing wood framed interior walls.
3. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.
4. Section 07 2100 - Thermal Insulation: Acoustic insulation.
5. Division 07 - Roofing sections: Water-resistive barrier over sheathing.
6. Division 07 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.
7. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.
8. Section 092216 "Non Structural Metal Framing".
9. Section 099000 "Paints and Coatings".

#### 1.03 REFERENCE STANDARDS

- A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members 2016, with Supplement (2018).
- B. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units 2018.
- C. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units 1999 (Reaffirmed 2016).
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.

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- E. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process 2022.
- F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members 2015.
- G. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method 2017.
- H. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2017.
- I. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing 2003 (Reapproved 2017).
- J. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members 2018.
- K. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.
- L. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.
- M. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2018.
- N. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs 2020.
- O. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base 2019.
- P. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing 2017.
- Q. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel 2018.
- R. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel 2017.
- S. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing 2018.
- T. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units 2021.
- U. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.
- V. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2016.
- W. ASTM E413 - Classification for Rating Sound Insulation 2016.
- X. GA-600 - Fire Resistance and Sound Control Design Manual, 22nd edition 2018.
- Y. UL (FRD) - Fire Resistance Directory Current Edition.

- Z. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances Current Edition, Including All Revisions.

#### 1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- D. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
- E. SSMA / SSFSA Manufacturer Qualification: Submit documentation of manufacturer association membership.

#### 1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing, with minimum 3 years of experience.
- B. Manufacturer Qualifications: Member of Steel Stud Manufacturers Association (SSMA): [www.ssma.com/#sle](http://www.ssma.com/#sle).

#### 1.06 STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

#### 1.07 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install interior products until installation areas are enclosed and conditioned.
- C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

### PART 2 - PRODUCTS

#### 2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.

- B. Interior Partitions, Indicated as Sound-Rated: Provide completed assemblies with the following characteristics:
  - 1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- C. Shaft Walls at Elevator Shafts: Provide completed assemblies with the following characteristics:
  - 1. Air Pressure Within Shaft: Intermittent loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
  - 2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- D. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:
  - 1. Fire-Resistance-Rated Shaft Walls: UL listed assembly No. (as indicated on drawings); 2 hour rating.
  - 2. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

## 2.02 PANELS, GENERAL

- A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
- B. Recycled Content of Gypsum Board: Provide documentation indicating post-consumer recycled content plus one-half of pre-consumer recycled content of at least 25%.

## 2.03 INTERIOR GYPSUM BOARD

- A. Abuse-Resistant Type: Manufactured to produce greater resistance to surface indentation, through-penetration (impact resistance), and abrasion than standard, regular-type and Type X gypsum board.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. G-P Gypsum; ToughRock Abuse-Resistant Gypsum Board.
    - b. National Gypsum Company; Hi-Abuse Brand Wallboard.
    - c. United States Gypsum Co.; Fiberock Brand Abuse-Resistant Gypsum Fiber Panel.
  - 2. Core: 5/8 inch.
  - 3. Long Edges: Tapered.
- B. Moisture- and Mold-Resistant Type: With moisture- and mold-resistant core and surfaces.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. G-P Gypsum; DensArmor Interior Guard.
    - b. National Gypsum Company; XP Wallboard.
    - c. USG Corporation; SHEETROCK Brand HUMITEK.
    - d. USG Corporation; FIBEROCK Brand, Aqua Tough Interior Panels.
  - 2. Core: 5/8 inch, Type X.
  - 3. Long Edges: Tapered.

## 2.04 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. CertainTeed Corp.; GlasRoc Tile Backer.



- b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.
- 2. Core: 5/8 inch, Type X.
- 3. Mold Resistance: ASTM D 3273, score of 10.

## 2.05 EXTERIOR GYPSUM SHEATHING

- A. Products: Subject to compliance with requirements, provide one of the following:
  - 1. G-P Gypsum; DensDeck Roof Board.
  - 2. G-P Gypsum; DensGlass Sheathing Board.
  - 3. National Gypsum Company; XP Wallboard.
  - 4. USG Corporation; SHEETROCK Brand HUMITEK.
  - 5. USG Corporation; FIBEROCK Brand, Aqua Tough Interior Panels.
  - 6. Mat face: fiberglass
  - 7. Core: 5/8 inch gypsum, Type X meeting ASTM E136
  - 8. Long Edges: Tapered.

## 2.06 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
  - 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, or paper-faced galvanized steel sheet.
  - 2. Shapes:
    - a. Cornerbead.
    - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
    - c. Expansion (control) joint.

## 2.07 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape for Interior Gypsum Wallboard: Paper.
- C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
  - 1. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
  - 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping or drying-type, all-purpose compound.
    - a. Use setting-type compound for installing paper-faced metal trim accessories.
  - 3. Fill Coat: For second coat, use setting-type, sandable topping or drying-type, all-purpose compound.
  - 4. Finish Coat: For third coat, use setting-type, sandable topping or drying-type, all-purpose compound.

## 2.08 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
  - 1. VOC Emissions for Adhesives: Provide certificate of compliance with California Department of Public Health (CDPH) Standard Method v1.1 – 201, using the applicable exposure scenario.

2. VOC Content for Adhesives: Provide documentation of compliant VOC content per SCAQMD Rule 1168.
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Examine areas and substrates, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.02 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.
- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

#### 3.03 APPLYING INTERIOR GYPSUM BOARD

- A. Install abuse-resistant gypsum board for vertical surfaces, unless otherwise indicated.
- B. Install moisture- and mold-resistant interior gypsum board for ceiling and soffit surfaces, unless otherwise indicated.
- C. Single-Layer Application:
  1. On ceilings, apply gypsum panels at right angles to framing, unless otherwise indicated.
  2. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

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GYPSUM BOARD

### 3.04 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
  - 1. Cornerbead: Use at outside corners, unless otherwise indicated.
  - 2. LC-Bead: Use at exposed panel edges.
  - 3. U-Bead: Do not use.

### 3.05 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
  - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
  - 2. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.

### 3.06 SHAFT WALL INSTALLATION

- A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
  - 1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
  - 2. Install studs at spacing required to meet performance requirements.
- B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.
  - 1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
  - 2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

### 3.07 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.
  - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
  - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 2500

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## SECTION 09 3000 TILING

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

#### 1.02 SECTION INCLUDES:

- A. Furnish and Install:
  - 1. Tiling including bathroom wall and floor finishes.
  - 2. Provide tile section as indicated on room finish schedule.
- B. Related Sections:
  - 1. Division 03 Concrete and Division 04 Masonry
  - 2. Section 079200 Joint Sealants
  - 3. Section 092215 Interior Non Structural Metal Framing
  - 4. Section 092500 Gypsum Board
  - 5. Section 102800 Toilet Accessories
  - 6. Division 22 Plumbing
  - 7. Division 23 Heating, Ventilating, and Air Conditioning
  - 8. Division 26 Electrical

#### 1.03 SUBMITTALS:

- A. Product Data: Manufacturer's data including instructions, recommendations, and restrictions.
- B. Verification Samples: 12 x 12 inches.

#### 1.04 QUALITY ASSURANCE:

- A. Comply with manufacturer's instructions and recommendations.
- B. Provide medium to large format porcelain ceramic tile floors and wainscot with cove base and wainscot cap in restrooms and showers as shown on drawings. Install using crack isolation membrane that complies with ANSI A118.12 for high performance as recommended by manufacturer. Follow the TCNA "Handbook for Ceramic, Glass, and Stone Tile Installation" guidelines for large format tile installation methods. Comply with parts of the ANSI A108 series "Specifications for Installation of Ceramic Tile" that are referenced in TCNA installation methods.
- C. Dynamic Coefficient of Friction: Not less than 0.42.
- D. Certification: Tile certified by the Porcelain Tile Certification Agency.

1.05 DELIVERY, STORAGE, HANDLING:

- A. Comply with Division 01 General Requirements and Manufacturer's Instructions and recommendations.

1.06 MAINTENANCE STOCK:

- A. Required.
- B. Material: Each type and color of tile used.
- C. Quantity: 2 percent of actual installation quantity from the same manufactured lots.
- D. Packaging: Factory sealed boxes.
- E. Labeling: Date, vendor, installer, product name, mill, and installation location.

PART 2 PRODUCTS

2.01 TILE SCHEDULE:

- A. Glazed and Porcelain Ceramic Tile as specified on drawings.
  - 1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Provide Basis of Design products listed on drawings from the following manufacturer:
    - b. Basis of Design:
      - 1) DALTile
    - c. Approved equivalent by one of the following:
      - 1) Crossville Inc.
      - 2) American Olean
  - 2. DALTile, CLASSIC COLOR WHEEL, 1012 MUSTARD, 6"x6", WITH 6"x6" BULLNOSE
  - 3. DALTile, CLASSIC COLOR WHEEL, 0135 ALMOND, 6"x6", WITH 6"x6" BULLNOSE
- B. Tile Trim: Schluter Systems, coves and corner beads as scheduled in Drawings.

2.02 METAL TRIM

- A. As indicated on Drawings:
- B. Wall Trim, inside and outside corners: See Finish Schedule.
- C. Wall Base Trim: See Finish Details.
- D. Metal Edge Strips: Edge-protection, finishing and transition profiles for floors and walls; stainless-steel, ASTM A 666, Type 316 Series exposed-edge material, except as available in Type 304 only.
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide products of Schluter Systems.
  - 2. Refer to Drawings for specific profile designations and use.

2.03 SETTING MORTAR AND ADHESIVE:

- A. Organic Adhesive: A136.1 American National Standard Specifications for Organic Adhesives for Installation of Ceramic Tile.
  - 1. Type: Type I.
  - 2. VOC Content: less than or equal to 65 grams per liter.
  - 3. VOC Emissions for Adhesives: Provide certificate of compliance with California Department of Public Health (CDPH) Standard Method v1.1-2010, using the applicable exposure scenario.
  - 4. VOC Content for Adhesives: Provide statement of compliance of VOC content per SCAQMD Rule 1168.
- B. Latex Portland Cement Mortar: A118.4 American National Standard Specifications for Latex Portland Cement Mortar.
- C. Medium Bed Mortar - Basis of Design: "255 MultiMax" mixed with "333 Super Flexible Additive" Laticrete International, Inc
  - 1. Maximum Mortar Depth: 0.75 inch.
  - 2. ASTM C627 Robinson Floor Test Rating: Extra heavy duty.
  - 3. Trowel Notch Size: Comply with mortar manufacturer's recommendations for tile size.
- D. Epoxy Adhesive: A118.3 American National Standard Specifications for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive.
  - 1. VOC Content: less than or equal to 65 grams per liter.
    - a. VOC Emissions for Adhesives: Provide certificate of compliance with California Department of Public Health (CDPH) Standard Method v1.1-2010, using the applicable exposure scenario.
    - b. VOC Content for Adhesives: Provide statement of compliance of VOC content per SCAQMD Rule 1168.

2.04 GROUT:

- A. Regional Materials: When available, aggregate for mortar and grout, cement and lime shall be extracted, harvested, or recovered, as well as manufactured, within 100 miles of project site.
- B. Epoxy Grout: A118.3 American National Standard Specifications for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive.
- C. Latex Cement Grout: A118.7 American National Standard Specifications for Polymer Modified Cement Grouts for Tile Installation.
- D. Grout Colors: Selected by Architect from manufacturer's complete range of options.

2.05 ANTI-FRACTURE MEMBRANE:

- A. Standards:
  - 1. A118.12 American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation.
- B. Anti Fracture Membrane:
  - 1. "Fabric Reinforced Blue 92", Laticrete International, Inc
  - 2. NobleSeal CIS", The Noble Company
  - 3. ECB", National Applied Construction Products, Inc

- C. Waterproof Anti Fracture Membrane:
  - 1. "Fabric Reinforced 9235", Laticrete International Inc
  - 2. NobleSeal TS", The Noble Company
  - 3. Strataflex", National Applied Construction Products Inc

2.06 SUBFLOOR PATCHING AND UNDERLAYMENT:

- A. Comply with manufacturer's requirements and recommendations for subfloor preparation.

2.07 CONTROL JOINT SEALANTS:

- A. Comply with Section 079200 Joint Sealants.
- B. Sealant Colors: Selected by Architect from manufacturer's complete range of options.

2.08 CLEANER:

- A. Basis of Design: "Aqua Mix Concentrated Stone and Tile Cleaner", Custom Building Products, [www.custombuildingproducts.com](http://www.custombuildingproducts.com).
  - 1. VOC Content: Zero.

PART 3 EXECUTION

3.01 TILING INSTALLATION - GENERAL:

- A. Comply with manufacturer's instructions and recommendations.
- B. Subfloors:
  - 1. Confirm acceptability of substrate conditions.
  - 2. Confirm acceptability of ambient and substrate environmental conditions.
- C. Preparation - General: Provide all preparation required by ANSI A108.01 General Requirements: Sub-surfaces and Preparations by Other Trades.
- D. Clean Substrates: Remove all soil, dust, oil, grease, curing compounds, paint, foreign materials, and contamination.
- E. Prepare Substrates:
  - 1. Grind subfloor protrusions, ridges, and humps flush.
  - 2. Fill subfloor holes, cracks, and depressions with subfloor treatment material.
  - 3. Provide smooth subfloors.
- F. Tile Installation Basic Requirements:
  - 1. Lay tile in grid pattern with joints accurately aligned throughout each installation area.
  - 2. Center tile in both directions.
  - 3. Avoid use of less than one half tile units.
  - 4. Extend tile into recesses and under and behind movable items.
  - 5. Fit tile accurately at obstructions and perimeter.
  - 6. Do not damage visible tile surfaces or edges.
  - 7. Provide uniform grout joint width for each installation area.
  - 8. For tile installed in factory mounted sheets, make field joints match factory joints.



9. Mix and install grout in compliance with manufacturer's instructions and recommendations.
10. Protect installed tile from traffic for at least 7 days after grouting.
11. Clean tile to remove excess grout, mortar, and adhesive from finished tile surfaces.

G. Wall Tile Basic Requirements:

1. Height: As shown or, if not shown, full height to structure above.
2. Prohibition: Start wall tile at Schluter wall base and work upward. Do not install tile from top down.

H. Patterns: Match patterns shown.

I. Installed Tolerances:

1. Variation from True Plumb, Level, Line, Plane: Maximum 0.062 inch in 10 feet.
2. Variation from True Plane Across Joints [Lippage]: Maximum 0.03 inch.

J. Edge Trim: Provide continuous edge trim for all floor edges not covered by wall base.

1. Minimize edge trim seams.

K. Repair: Replace damaged tile with full size, undamaged tile. Remove and replace damaged work.

3.02 TILE INSTALLATION METHODS:

- A. Standard: Tile Council of North America "Handbook for Ceramic, Glass, and Stone Tile Installation".
- B. Tile Wall Installation on Cement Board: "W244C" with cement bond coat.
- C. Tile Wall Installation on Gypsum Board: "W242".
- D. Tile Wall Installation on concrete curb / existing masonry provide thick set with metal mesh as required for vertical installation for 1/2" tile.

3.03 GROUT:

- A. Epoxy Grout: Floors and bottom course of wall tile.
- B. Latex Cement Grout: All locations where epoxy grout is not specified.
- C. Grout Tooling: Slightly recessed from tile face.

3.04 ADDITIONAL REQUIREMENTS FOR ANTI FRACTURE MEMBRANE:

- A. Comply with Manufacturer's Instructions and Recommendations.
- B. Standards: Comply with
  1. A108.17 Installation of Crack Isolation Membranes.
  2. A108.13 Installation of Load Bearing, Bonded, Waterproof Membranes for Thin Set Ceramic Tile and Dimension Stone.
- C. Anti Fracture Membrane Required Locations: All thin set installations over non slab on grade subfloors.
- D. Restrictions:

1. Conceal membrane from view in the completed installation.
  2. Do not span over expansion joints, control joints, and structural cracks in the subfloor.
- E. Waterproof Anti Fracture Membrane Required Locations: Floors throughout:
1. Toilet rooms.
  2. Bathrooms.
- F. Additional Requirements for Waterproof Anti Fracture Membrane:
1. Provide subfloor treatment material to slope to drain.
  2. Provide 100 percent waterproof installation.
  3. Flash membrane into floor drains.
  4. Run membrane continuously from floor up walls at least 4 inches above floor.
  5. Run membrane continuously under thresholds.

### 3.05 ADDITIONAL REQUIREMENTS FOR EXPANSION AND CONTROL JOINTS:

- A. Comply with EJ171, Tile Council of North America "Handbook for Ceramic, Glass and Stone Tile Installation".
- B. Expansion and Control Joint Locations: As shown or, if not shown, as pre approved by Architect:
1. Over all changes in substrates under tile.
  2. Over all expansion joints, control joints, construction joints, cold joints, sawn joints in substrate.
  3. At all intersections of tile work and dissimilar work other than floor drains.
  4. At all intersections between tile and restraining construction.
  5. At inside corners concave corners of tile-to-tile work and changes of plane within tile work.
  6. 20 feet on center, both directions.
- C. Expansion and Control Joint Sealant Width:
1. Substrate Joints: Make tile expansion and control joint width = substrate joint width.
  2. Interior Work: Minimum 0.25 inch, but not less than grout joint width.
- D. Preparation:
1. Clean joints in substrates.
  2. Ensure substrate joints are free of dirt, debris, mortar, setting materials, and grout.
  3. Cover cleaned joint with fiberglass tape to help keep joint clean.
  4. Make the tile joint the full depth of the tile setting bed for the full joint width.
  5. If the joint is deeper than the backer rod, provide compressible filler under the backer rod.
  6. Sand and clean joint edges and tile surfaces to which sealant is adhered to improve adhesion.
  7. Clean tile joints and remove dirt, debris, mortar, setting materials, and grout.
  8. Prime joint edges as recommended by sealant manufacturer prior to sealant installation.
- E. Joint Sealant Installation: Comply with Section 07 9200 Joint Sealants.
1. Install surface of sealant flush with adjacent grout surfaces.
- F. Saw Cutting Tile for Expansion and Control Joints: Not permitted.
- G. Saw Cutting Concrete Subfloor for Expansion and Control Joints: Permitted.

END OF SECTION 09 3000

SECTION 09 6200  
RESINOUS POURED IN PLACE RESILIENT FLOORING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.02 SUMMARY

- A. Section Includes: high performance resinous flooring systems for moisture control for the following applications:
- B. Concrete slabs on grade.
- C. Resinous flooring system as shown on the drawings and in schedules.

1.03 RELATED SECTIONS

- A. Section 030100 "Maintenance of Concrete"
- B. Section 033000 "Cast-In-Place Concrete"
- C. Section 042000 "Unit Masonry"
- D. Section 079200 - "Joint Sealants"
- E. Section 092500 - Gypsum Board
- F. Division 22 - Plumbing

1.04 REFERENCE STANDARDS

- A. NACE No. 6/SSPC-SP 13 - Surface Preparation of Concrete
- B. ACI 308 – Standard Practice for Curing Concrete
- C. ACI 302.1R-80 - Guide for Concrete Floor and Slab Construction
- D. American Society for Testing and Materials (ASTM)

1.05 SYSTEM DESCRIPTION

- A. Floor topping system shall be 1/8" thick self-leveling with appropriate Primer and Topcoat.
- B. Topping system shall cure and be available to normal traffic in no more than 60 minutes at 68 deg F after application of last coat. It shall have a maximum water absorption value of 0.04 weight percent in accordance with ASTM D570. It shall be chemically resistant to a wide range of acids, alkalis, salts, fats, oils and other chemicals.

- C. The finished floor coating system shall be uniform in color, texture, and appearance. All edges that terminate at walls, floor discontinuities, and other embedded items shall be sharp, uniform, and cosmetically acceptable with no thick or ragged edge. The Contractor shall work out an acceptable masking technique to ensure the acceptable finish of all edges.

#### 1.06 SUBMITTALS

- A. Prior to commencing work, submit manufacturer's technical information and installation details to describe materials to be used. The same manufacturer shall supply all polymer underlayments wall and floor finishes.
- B. Product Data: Latest edition of Manufacturer's literature including performance data and installation procedures.
- C. Manufacturer's Safety Data Sheet (SDS) for each product being used.
- D. Samples: A 3 x 3 inch square sample of the proposed system. Color, texture, and thickness shall be representative of overall appearance of finished system subject to normal tolerances.
- E. Submit manufacturer's certificate of compliance that materials meet specification requirements.
- F. Samples for Initial Selection: Manufacturer's color charts showing colors and glosses available for flooring and game-line and marker paints.
- G. Samples for Verification: For each color, gloss, and texture of flooring required, 12 inches square, applied to a rigid backing. Include sample sets showing the game-line paint and marker paint colors applied to the flooring.
- H. Qualification Data: For Installer.
- I. Maintenance Data: For fluid-applied flooring to include in maintenance manuals.
- J. Warranties: Special warranties specified in this Section.

#### 1.07 QUALITY ASSURANCE

- A. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, and resin-based monolithic floor surfacing designed to produce a seamless floor and integral cove base. Non-slip for wet locations.
- B. Color and Pattern: As selected by Architect from manufacturer's full range.
- C. Overall System Thickness : ¼ inch.
- D. Reinforcing Membrane: Flexible resin formulation that is recommended by resinous flooring manufacturer.
- E. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- F. Manufacturer's Qualifications:
  - 1. No request for substitution shall be considered that would change the generic type of coating system specified (i.e., 100% reactive, Methyl Methacrylate based acrylic liquid). Equivalent materials of other manufacturer's may be substituted only on approval of the Architect or Engineer. Requests shall include the respective manufacturer's

technical literature for each product giving the name, generic type, descriptive information, recommended dry film thickness (DFT), Material Safety Data Sheet (MSDS), and certified test reports showing results to equal performance criteria of products specified herein.

2. Manufacturer must show a minimum 10 year history of manufacturing MMA products for the specified application. Manufacturer must show a minimum of 10 projects of equal size and magnitude as this project.
- G. Installer Qualifications:
1. An installer (applicator) who is approved, trained, or certified by fluid-applied flooring manufacturer with skilled mechanics having not less than 10 years satisfactory experience in installation of specified systems.
- H. Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to flooring application including, but not limited to, the following:
1. Substrate conditions, including moisture content.
  2. The agenda shall include a review and clarification of this specification, application procedures, quality control, inspection and acceptance criteria, and production schedules. Applicator is not authorized to proceed until this meeting is held or waived by Owner.
- I. Mock-Ups:
1. Apply 12"x12" mock-up sample where directed by Architect to verify selections submitted and confirm adhesion to substrate.
  2. Upon acceptance of Architect, sample area will be the standard of workmanship quality throughout the project.
- J. Bond Testing:
1. Surface preparation efforts shall be evaluated by conducting Bond Tests at the site prior to application of the flooring system(s).
- K. Delivery, Storage, And Handling
1. Store materials in accordance with manufacturer's instructions and with seals and labels intact and legible. Maintain temperatures within required range and keep from freezing. Do not use materials that exceed manufacturer's maximum recommended shelf life.
  2. Store and dispose of solvent-based materials and materials used with solvent-based materials in accordance with requirements of local authorities having jurisdiction. Maintain a clean, dry storage area, to prevent contamination or damage to coatings.
  3. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.
  4. Materials shall be stored indoors, protected from damage, moisture, direct sunlight and temperatures below 50 degrees F or above 80 degrees F.
  5. All components of the system shall be delivered to the site in the Manufacturer's packaging, clearly identified with the product type and batch number.
  6. The Applicator shall be provided with a storage area for all components. The area shall be between 60 F and 90 F, dry, out of direct sunlight and in accordance with the Manufacturer's recommendations and relevant health and safety regulations.
  7. Copies of Safety Data Sheets (SDS) for all components shall be kept on site for review by the Engineer or other personnel.
  8. The Applicator shall be provided with adequate disposal facilities for non-hazardous waste generated during installation of the system.

## 1.08 PROJECT CONDITIONS

- A. Environmental: Evaluate the substrate condition, including moisture content and extent of substrate leveling and repairs required, if any.
- B. Condition minimum slab temperature to 50 degrees F for 48 hours before commencing installation, during installation, and for at least 72 hours after completing installation. Maintain substrate temperature at least 5 degrees F above dew point during installation.
- C. Maintain lighting at a minimum uniform level of 50 or more foot candles in areas where flooring system is being installed
- D. Do not apply coatings in areas where dust is being generated.
- E. Repair leaks from pipes and other sources prior to installation.
- F. Provide adequate continuous ventilation for 24 hours before, during and 48 hours after application of finishes.
- G. Site Requirements
  - 1. Application may proceed while air, material and substrate temperatures are between 60 F and 90 F providing the substrate temperature is above the dew point. Outside of this range, the Manufacturer shall be consulted.
  - 2. The relative humidity in the specific location of the application shall be less than 85 % and the surface temperature shall be at least 5 F above the dew point.
  - 3. The Applicator shall ensure that adequate ventilation is available for the work area.
  - 4. The Applicator shall be supplied with adequate lighting equal to the final lighting level during the preparation and installation of the system.
- H. Conditions of new concrete to be coated with epoxy material.
  - 1. Concrete shall be moisture cured for a minimum of 7 days and have fully cured a minimum of twenty eight days in accordance with ACI-308 prior to the application of the coating system pending moisture tests.
  - 2. Concrete shall have a flat rubbed finish, float or light steel trowel finish (a hard steel trowel finish is neither necessary or desirable).
  - 3. Sealers and curing agents should not to be used.
  - 4. Concrete surfaces on grade shall have been constructed with a vapor barrier to protect against the effects of vapor transmission and possible delamination of the system.
- I. Safety Requirements
  - 1. All open flames and spark-producing equipment shall be removed from the work area prior to commencement of application.
  - 2. "No Smoking" signs shall be posted at the entrances to the work area.
  - 3. The Owner shall be responsible for the removal of foodstuffs from the work area.
  - 4. Non-related personnel in the work area shall be kept to a minimum.

## 1.09 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fluid-applied flooring installation that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: 3 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 FLUID-APPLIED FLOORING

- A. Products: subject to compliance with requirements, provide one of the following:
  - 1. Basis-of-Design: Product by Dur-a-flex [www.dura-a-flex.com](http://www.dura-a-flex.com)
    - a. DUR-A-CHIP, MACRO, OYSTER SHELL, WITH 6" HIGH INTEGRAL COVE BASE as indicated on drawings.
  - 2. Dur-A-Flex, Inc., 95 Goodwin Street, East Hartford, CT 06108, Phone: (860) 528-9838, Fax: (860) 528-2802
  - 3. Approved equivalent by one of the following:
    - a. MasterTop decorative epoxy flooring system as manufactured by BASF Corporation, [www.master-builders-solutions.bas.us](http://www.master-builders-solutions.bas.us), 800-433-9517.
    - b. Stonhard
    - c. Florock
    - d. SIKA CORPORATION • FLOORING, 201 Polito Avenue, Lyndhurst, NJ 07071
    - e. Tel: 800-933-7452 [www.SikaFloorUSA.com](http://www.SikaFloorUSA.com)
    - f. Sikafoor® DecoFlake® Institutional, Industrial & Commercial Flooring
    - g. Manufacturer of Approved System shall be single source and made in the USA.

2.02 FLOORING

- A. Basis of Design: DUR-A-CHIP, MACRO, OYSTER SHELL, WITH 6" HIGH INTEGRAL COVE BASE
- B. Dur-A-Flex, Inc, Dur-A-Chip, Epoxy-Based seamless flooring system:
  - 1. System Materials:
    - a. Primer: Dur-A-Flex, Inc, Dur-A-Glaze #4 WB resin and hardener.
    - b. First Broadcast Coat: Dur-A-Flex, Inc, Dur-A-Gard OPF resin and hardener.
      - 1) Chips: Dur-A-Flex, Inc. Macro Decorative Colored Chips.
    - c. Second Broadcast and Grout Coat: Dur-A-Flex, Inc. Dur-A-Glaze #4 resin and Water Clear hardener.
      - 1) Chips: Dur-A-Flex, Inc. Macro Decorative Colored Chips.
    - d. Grout coat: Dur-A-Flex, Inc. Dur-A-Glaze #4 resin and Water Clear hardener.
    - e. Topcoat: Dur-A-Flex, Inc. Armor Top resin, hardener and grit.
  - 2. Patch Materials:
    - a. Shallow Fill and Patching: Use Dur-A-Flex, Inc. Dur-A-Glaze #4 Cove Rez.
    - b. Deep Fill and Sloping Material (over ¼ inch): Use Dur-A-Flex, Inc. Dur-A-Crete.

2.03 PRODUCT REQUIREMENTS

- A. Primer: Dur-A-Glaze #4 WB
  - 1. Percent Solids 56 %
  - 2. VOC 2 g/L
  - 3. Bond Strength to Concrete ASTM D 4541 550 psi, substrates fails
  - 4. Hardness, ASTM D 3363 3H
  - 5. Elongation, ASTM D 2370 9 %
  - 6. Flexibility (1/4: Cylindrical mandrel), ASTM D 1737 Pass
  - 7. Impact Resistance, MIL D-2794 >160
  - 8. Abrasion Resistance ASTM D 4060,
  - 9. CS 17 wheel, 1,000 g Load 30 mg loss

B.	Broadcast Coat	Dur-A-Gard OPF
1.	Percent Solids	100 %
2.	VOC	59 g/L
3.	Compressive Strength, ASTM D 695	16,000 psi
4.	Tensile Strength, ASTM D 638	3,800 psi
5.	Flexural Strength, ASTM D 790	4,000 psi
6.	Abrasion Resistance, ASTM D 4060	
7.	C-10 Wheel, 1,000 gm load, 1,000 cycles	35 mg loss
8.	Flame Spread/NFPA-101, ASTM E 84	Class A
9.	Impact Resistance MIL D-3134	0.025 inch Max
10.	Water Absorption. MIL D-3134	Pass
11.	Potlife @ 70 F	20-25 minutes
C.	Broadcast Coat and Grout Coat	Dur-A-Glaze #4 Water Clear
1.	Percent Solids	100 %
2.	VOC	3.8 g/L
3.	Compressive Strength, ASTM D 695	11,200 psi
4.	Tensile Strength, ASTM D 638	2,100 psi
5.	Flexural Strength, ASTM D 790	5,100 psi
6.	Abrasion Resistance, ASTM D 4060	
7.	C-10 Wheel, 1,000 gm load, 1,000 cycles	29 mg loss
8.	Flame Spread/NFPA-101, ASTM E 84	Class A
9.	Impact Resistance MIL D-24613 cracking or delamination	0.0007 inches, no
10.	Water Absorption. MIL D-24613	Nil
11.	Potlife @ 70 F	20 minutes
D.	Topcoat	Armor Top
1.	Percent Solids	95 %
2.	VOC	0 g/L
3.	Tensile Strength, ASTM D 2370	7,000 psi
4.	Adhesion, ASTM 4541	Substrate Failure
5.	Hardness, ASTM D 3363	4H
6.	60° Gloss ASTM D 523	70
7.	Abrasion Resistance, ASTM D4060	Gloss Satin
8.	CS 17 wheel (1,000 g load) 1,000 cycles	4 8 mg loss with grit 10 12 mg loss without grit
9.	Pot Life, 70 F, 50% RH	2 Hours
10.	Full Chemical Resistance	7 days

#### 2.04 MATERIALS - ACCESSORIES

- A. Patching and Fill Materials: Install resinous patching and filler products to fill holes, depressions, imperfections, damages, and deteriorated concrete as recommended by manufacturer of products used.
- B. Joint Sealant: Install products as recommended by manufacturer for type of service and joint condition indicated.
- C. Application Equipment: Drip cloths, warning signs, and other ancillary accessories required to complete coating work and as recommended by coating manufacturer.

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RESINOUS POURED IN PLACE RESILIENT FLOORING



## 2.05 MIXING

- A. Mix and prepare painting materials in accordance with manufacturer's published directions.
- B. Maintain containers used in mixing and application of coatings in a clean condition, free of foreign materials and residue.
- C. Stir materials before application to produce a mixture of uniform density, and stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
- D. Do not thin coating materials unless recommended by manufacturer. When thinning is permitted, comply with manufacturer's printed instructions using only thinners approved by floor coating manufacturer.

## 2.06 COLORS

- A. Colors as scheduled on the drawings.
- B. Allow for various colors when submitting bid. Refer to initial color selections as indicated or noted on approved shop drawings.

## 2.07 SOURCE QUALITY CONTROL

- A. Testing of Coating Materials: Owner reserves the right to invoke the following procedure:
  - 1. Owner will engage the services of a qualified testing agency to sample coating materials. Contractor will be notified in advance and may be present when samples are taken. If coating materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.
  - 2. Testing agency will perform tests for compliance with product requirements.
  - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove non-complying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Concrete must have a curing period of 28 days minimum at 70° F. The surface must be clean and dry, physically sound and free of contamination. Surfaces must be free of holes, voids or defects. Cracks and abrupt changes in surface profile must be corrected. Fins and projections must be removed. All curing compounds and sealers must be removed.
- B. Contractor must report, in writing, surfaces left in improper condition by other trades. Application will constitute acceptance of surfaces by the applicator.
- C. Verify that moisture content is within range acceptable to flooring manufacturer, using calcium chloride test kit in accordance with ASTM F-1869.
- D. Verify each drain in installation area is working and at actual finished elevation of flooring system.

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RESINOUS POURED IN PLACE RESILIENT FLOORING

- E. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

### 3.02 PREPARATION

- A. Surface must be clean, dry, and in sound condition. Remove stains, oil, dust, grease, dirt, rust, release agents, curing compounds and hardeners, salts, efflorescence, laitance, and other contaminants and foreign material to ensure adequate adhesion.
- B. Surfaces that are heavily contaminated shall be cleaned with the appropriate degreaser, detergent, or other appropriate cleaner/surfactant followed by thoroughly rinsing with fresh water to remove the accumulation prior to mechanical cleaning efforts. Mechanical cleaning will not remove such deposits, but only drive them deeper.
- C. Provide Concrete Surface Profile (CSP) as recommended by manufacturer for specified systems.
- D. Concrete shall have a moisture emission rate of no more than 5 lbs. per 1000 sq. ft. per 24 hour period as determined by proper Calcium Chloride Testing.
- E. Visit jobsite prior to installation of flooring system to evaluate substrate condition, quantity and severity of cracking, and extent of repairs needed. Repair substrate imperfections only after mechanical preparation of substrate.
  - 1. If surface deterioration presents an unacceptable surface, follow manufacturers written instructions for patching and resurfacing defective areas.
- F. Fill cracks, voids, bug holes and joints with appropriate filler, joint sealant, or patching material as recommended by manufacturer.
- G. Plug floor drains prior to application of resinous flooring to prevent materials from running into drains.
- H. Protect surrounding substrates and surfaces, as well as in-place equipment during surface preparation and system installation.
- I. Bond Testing
  - 1. The applicator shall evaluate all surface preparation by conducting bond tests at strategic locations.
  - 2. Mix six (6) ounces of the primer to be used in the application with #10-#12 mesh, dry quartz sand until an easily trowelable mixture is obtained. Add 10% by volume SRS Powder Hardener and mix well. Apply palm-sized patties 1/8" to 1/4" thick.
  - 3. After one (1) hour at (68° F.), patties must be cured tack-free and cooled to ambient temperature of concrete. Remove patties with hammer and chisel and examine fracture/delamination plane. Concrete with fractured aggregate must be attached to the entire underside of the patty.
  - 4. If only laitance or a small amount of concrete is attached or if interface between patty and substrate is tacky, further substrate preparation is required.
  - 5. If further surface preparation is required, bond tests shall be conducted again when this has been completed.
  - 6. If no amount or kind of surface preparation produces satisfactory bond tests, the applicator shall report that to the Owner, Engineer, and Manufacturer.
- J. Mechanical Surface Preparation and Cleaning
  - 1. The MasterTop SRS system requires a CSP 4-5 in accordance with ICRI CSP Surface Preparation Standards. All accessible concrete floor surfaces shall be mechanically blast

cleaned using a mobile steelshot, dust recycling machine such as BLASTRAC, as manufactured by Wheelabrator Corp., or approved equivalent. All surface and embedded accumulations of paint, toppings, hardened concrete layers, laitance, power trowel finishes, and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a profile similar to 40 grit sandpaper and exposing the upper fascia of concrete aggregate.

2. Floor areas inaccessible to the mobile blast cleaning machines shall be mechanically abraded to the same degree of cleanliness, soundness, and profile using vertical disc scarifiers, starwheel scarifiers, needle guns, scabblers, or other suitably effective equipment.
3. After blasting, traces or accumulations of spent abrasive, laitance, removed toppings, and other debris shall be removed with brush or vacuum.
4. Conduct Bond Tests to check adequacy of surface preparation. See Paragraph 3.03 - B (Bond Testing).
5. Application of the respective specified material system(s) must be completed before any water or other contamination of the surface occurs.

### 3.03 APPLICATION

#### A. General

1. The system shall be applied in six distinct steps as listed below:
  - a. Substrate preparation
  - b. Priming
    - 1) The primer shall be Dur-A-Glaze #4 WB Primer that is mixed at the ratio of 1 part resin to 4 parts hardener per the manufacturer's instructions.
    - 2) The primer shall be applied by 1/8 inch notched squeegee and back rolled at the rate of 200 sf/gal to yield a dry film thickness of 4 mils.
  - c. First broadcast coat application with first chip broadcast
  - d. Second broadcast coat with second chip broadcast
  - e. Grout coat application,
    - 1) The grout coat shall be comprised of a Dur-A-Glaze # 4 Water Clear epoxy that is mixed in the ratio of 1 part hardener to 2 parts resin and installed per the manufacturer's recommendations.
    - 2) The grout coat shall be squeegee applied and back rolled with a coverage rate of 100 sf/gal.
  - f. Topcoat application
    - 1) The topcoat of Armor Top shall be roller applied at the rate of 500 sf/gal to yield a dry film thickness of 3 mils.
    - 2) The finish floor will have a nominal thickness of 60 mils.
2. Immediately prior to the application of any component of the system, the surface shall be dry and any remaining dust or loose particles shall be removed using a vacuum or clean, dry, oil-free compressed air.
3. The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results in accordance with the Manufacturer's recommendations.
4. The system shall follow the contour of the substrate unless pitching or other leveling work has been specified by the Architect.
5. A neat finish with well-defined boundaries and straight edges shall be provided by the Applicator.

#### B. Broadcast Coats

1. The broadcast coat shall be applied as a double broadcast system as specified by the Architect.

2. The broadcast coat shall be comprised of two components, a resin, and hardener as supplied by the Manufacturer and mixed in the ratio of 2 parts resin to 1 part hardener.
  3. The resin shall be added to the hardener and thoroughly mixed by suitably approved mechanical means.
  4. The first broadcast coat shall be applied over horizontal surfaces using the dip and roll, and back roll method at the rate of 300 sf/gal using the Dur-A-Gard OPF material.
  5. Chips shall be broadcast to excess into the wet material, Macro chips at the rate of 0.1 lbs/sf.
  6. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose aggregate.
  7. Scrape the floor with a trowel or floor scraper. Sweep and vacuum the floor again.
  8. Apply a second broadcast coat of resin shall be applied by flat squeegee then back rolled with a coverage rate of 150 sf/gal with the Dur-A-Glaze #4 Water Clear epoxy.
  9. Chips shall be broadcast to excess, Macro chips at the rate of 0.1 lbs/sf.
  10. Allow material to fully cure. Vacuum, sweep and/or blow to remove all loose chips.
  11. Scrape the floor with a trowel or floor scraper. Sweep and vacuum the floor again.
- C. Apply each flooring system component in compliance with manufacturer's written installation instructions strictly adhering to mixing and installation methods, recoat windows, cure times, environmental restrictions, and with approved shop drawings.
- D. Use applicators and techniques suited for coating and substrate indicated. Keep applicators clean, free from contaminants, and suitable for required finish.
- E. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp lines and color breaks.
- F. Terminate flooring system at edge of isolation and expansion joints and install integral cover base as designated on Contract Documents.
1. Honor isolation, expansion, and other joints through flooring system.
- G. If undercoats or other conditions show through final coat, apply additional coats until cured coating has a uniform finish, color, and appearance.
- H. Allow materials to cure in compliance with manufacturer's directions. Prevent contamination during stages of application and prior to completion of curing process.

### 3.04 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
1. Applicator shall request acceptance of surface preparation from the Engineer before application of the prime/seal coat.
  2. Applicator shall request acceptance of the prime/seal coat from the Engineer before application of subsequent specified materials.
  3. Contractor shall touch up and restore coated surfaces damaged by testing.
  4. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

### 3.05 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. Remove spilled, splashed, or spattered coating materials promptly from other surfaces being careful not to damage surface finish of item being cleaned.
- C. Follow manufacturer's recommendations for touch-up, repair, and restoring of damaged finish; leave project in first class condition. Repair any defects that will hinder coating performance.
- D. Clean flooring system just prior to Substantial Inspection using materials and procedures recommended by system manufacturer.
- E. Protect flooring System from damage and wear during other phases of construction operations. Use temporary coverings as recommended by manufacturer, if required. Remove temporary covering just prior to Substantial Completion.
- F. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
- G. Remove masking. Perform detail cleaning at floor termination, to leave cleanable surface for subsequent work of other sections.

### 3.06 FLOORING SYSTEM SCHEDULE

- A. Paragraphs below identify specific floor coating materials and appropriate specified systems as indicated on Drawings.
- B. Decorative Epoxy Flooring system:
  - 1. Primer application rate shall be approx. 100 sq.ft. per gallon (approx. 12 mils).
  - 2. Coving shall be with appropriate filler installed per manufacturers recommendations.
  - 3. Patching/Sloping material system.
  - 4. Body coat applied with a gauge rake set at 1/8" for a rate of 40 sq. ft. per batch. Colored Quartz to be broadcast into the uncured topping. Broadcast the Colored Quartz at the rate of .75 pounds per sq. ft.
  - 5. Clear topcoat; apply at the rate of 90 - 100 sq. ft. per gallon for the first coat and 100 - 125 sq. ft. per gallon for the second application.

### 3.07 MANUFACTURERS RECOMMENDATIONS

- A. For more specific information concerning maintaining Methyl Methacrylate floors please consult the manufacturer at the above location.

END OF SECTION 09 6200

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## SECTION 09 6500 RESILIENT FLOORING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Resilient Wall Base as shown on drawings and listed in Finish Schedule.
- B. Resilient Tile Flooring as shown on drawings and listed in Finish Schedule.
- C. Resilient Rubber Wall Base as shown on drawings in Gym and listed in Finish Schedule.
- D. Preformed Resilient Stair Accessories as shown on drawings and listed in Finish Schedule.
- E. Installation Accessories as required to provide basis of design complete installations.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 0561 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

#### 1.03 REFERENCE STANDARDS

- A. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers 1998 (Reapproved 2023).
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- C. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission through Floor-Ceiling Assemblies Using the Tapping Machine 2022.
- D. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).
- E. ASTM E2179 - Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors 2021.
- F. ASTM F150 - Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring 2006 (Reapproved 2018).
- G. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2022.
- H. ASTM F970 - Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading 2022.
- I. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile 2004 (Reapproved 2018).

- J. ASTM F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing 2004 (Reapproved 2021).
- K. ASTM F1344 - Standard Specification for Rubber Floor Tile 2021a.
- L. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile 2020.
- M. ASTM F1859 - Standard Specification for Rubber Sheet Floor Covering Without Backing 2021a.
- N. ASTM F1861 - Standard Specification for Resilient Wall Base 2021.
- O. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2022.
- P. ASTM F1913 - Standard Specification for Vinyl Sheet Floor Covering Without Backing 2019.
- Q. ASTM F2034 - Standard Specification for Sheet Linoleum Floor Covering 2018.
- R. ASTM F2169 - Standard Specification for Resilient Stair Treads 2015 (Reapproved 2020).
- S. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes 2019a.
- T. ASTM F2195 - Standard Specification for Linoleum Floor Tile 2018.
- U. ASTM F2982 - Standard Specification for Polyester Composition Floor Tile 2018.
- V. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2023.
- W. NSF 332 - Sustainability Assessment for Resilient Floor Coverings 2022.
- X. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings 2011.
- Y. UL 2824 - GREENGUARD Certification Program Method for Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers Current Edition, Including All Revisions.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Indicate seaming plans and floor patterns.
  - 1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
  - 2. Show details of special patterns.
- D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
  - 1. Samples: Full-size units of each color, texture, and pattern of floor tile required.
  - 2. Samples for Initial Selection: For each type of floor tile indicated.
  - 3. Samples for Verification: Full-size units of each color and pattern of floor tile required.
  - 4. Product Schedule: For floor tile. Use same designations indicated on Drawings.



- E. Verification Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each resilient flooring product specified.
- F. Sustainable Design Submittal: Submit VOC content documentation for flooring and adhesives.
- G. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- H. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.
- I. Manufacturer's Qualification Statement.
- J. Installer's Qualification Statement.
- K. Closeout Submittals: Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- L. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Extra Flooring Material: 6 square feet of each type and color.
  3. Extra Wall Base: 24 linear feet of each type and color.
  4. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.
  5. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  6. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience ;Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required. .
- C. Testing Agency Qualifications: Independent firm specializing in performing concrete slab moisture testing and inspections of the type specified in this section.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- D. Protect roll materials from damage by storing on end.
- E. Do not double stack pallets.
- F. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces. Store flooring, adhesives and

accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

#### 1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.
- B. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- C. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- D. Close spaces to traffic during floor tile installation.
- E. Close spaces to traffic for 48 hours after floor tile installation.
- F. Install floor tile after other finishing operations, including painting, have been completed.

#### PART 2 PRODUCTS

##### 2.01 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
  - 2. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less

##### 2.02 RESILIENT FLOOR TILE MATERIALS

- A. Manufacturers: Basis of Design provide products by Armstrong Flooring, Inc. UNO
  - 1. Other manufactures subject to compliance with requirements, products by one of the following manufacturers may be submitted under the provisions of Division 01, Substitution Procedures.
- B. Basis of Design: Striations BBT and Migrations BBT Bio-Flooring manufactured by Armstrong.
  - 1. Description: Tile composed of polyester resin binder, fillers and pigments with colors and pattern dispersed uniformly throughout its thickness.
  - 2. Bio-flooring tile shall conform to the requirements of ASTM F 2982 Standard Specification for Polyester Composition Floor Tile. Note: Striations BBT™ and Migrations® BBT™ Bio-flooring's unique binder system does not contain polyvinyl chloride resins and plasticizers.
  - 3. Size: as indicated on drawing and typically 12 in. x 12 in. UNO.
  - 4. Thickness: 1/8"/0.125 in. (3.2mm)
- C. Colors and Patterns: to be selected from manufacturer's color options and per floor patterns shown in drawings.

- 2.03 RESILIENT RUBBER WALL BASE (with SHEET FLOORING PLANK; Refer to 09 6566 RESILIENT ATHLETIC FLOORING).
- A. Use Resilient Rubber Wall Base as shown on drawings in Gym and listed in Finish Schedule with Resilient Rubber Athletic Flooring.
  - B. Basis-of-Design Product: Subject to compliance with requirements, provide Tarkett Resilient Vent Cove Rubber Wall Base.
    - 1. Tarkett North America
    - 2. Phone: (800) 899-8916
    - 3. 30000 Aurora Rd. Solon, Ohio 44139
    - 4. Web: [www.tarkettna.com](http://www.tarkettna.com) E-mail: [info@tarkett.com](mailto:info@tarkett.com)
  - C. Performance requirements meets ASTM F1861 Standard Specification for Resilient Thermoplastic Rubber Wall Base, Type TP, Group 1.
  - D. Thickness: 0.125" (3.17 mm)
  - E. Type: VENT COVE BASE,
  - F. Height: 4"
  - G. Roll length: 100' (30.48 m)
  - H. Corners: Inside Corners and Outside Corners
  - I. Colors and Patterns: As selected by Architect from full range of industry colors.
    - 1. (40 BLACK, 4" HIGH)
  - J. Test Data:
    - 1. Flexibility, ASTM F137: Passes 1/4 inch mandrel
    - 2. Resistance to light, ASTM F1515: Passes
    - 3. Resistance to chemicals, ASTM F925: Passes
    - 4. ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm<sup>2</sup> or greater, Class 1.

2.04 TILE FLOORING

- A. Vinyl Composition Tile - Type as indicated on drawings: Homogeneous, with color extending throughout thickness.
  - 1. Provide Basis of Design products listed on drawings from the following manufacturer: Johnsonite, a Tarkett Company.
  - 2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).
    - a. Armstrong Flooring, Inc; Excelon SDT: [www.armstrongflooring.com/#sle](http://www.armstrongflooring.com/#sle).
    - b. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
  - 3. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
  - 4. Size: 12 by 12 inch or as indicated on drawings.
  - 5. VOC Content Limits: As specified in Section 01 6116.
  - 6. Thickness: 0.125 inch.
  - 7. Pattern and Color: As indicated on drawings.
    - a. TARKETT, VCT II, COLOR: 509 PEWTER, SIZE 12" x 12"

- b. TARKETT, VCT II, COLOR: 580 MINERAL WHITE, SIZE 12" x 12"
  - c. TARKETT, VCT II, COLOR: 500 BUTTERMILK, SIZE 12" x 12"
  - d. TARKETT, VCT II, COLOR: 526 GREEN GRAPE, SIZE 12" x 12"
- B. Vinyl Tile - Type as indicated on drawings: Solid vinyl with color and pattern throughout thickness.
- 1. Provide Basis of Design products listed on drawings from the following manufacturer: Johnsonite, a Tarkett Company.
  - 2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).
    - a. Armstrong Flooring Inc; Natural Creations with Diamond 10 Technology ArborArt: [www.armstrong.com/#sle](http://www.armstrong.com/#sle).
    - b. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
    - c. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - d. LG Hausys America, Inc; : [www.lghausysusa.com/#sle](http://www.lghausysusa.com/#sle).
    - e. Metroflor Corporation; Aspecta Five LVT: [www.aspecta flooring.com/#sle](http://www.aspecta flooring.com/#sle).
    - f. Roppe Corporation: [www.roppe.com/#sle](http://www.roppe.com/#sle).
    - g. Shannon Specialty Floors, Inc; Tuf Stuf T3 Luxury Vinyl Tile: [www.shannonspecialtyfloors.com/#sle](http://www.shannonspecialtyfloors.com/#sle).
    - h. Substitutions: See Section 01 6000 - Product Requirements.
  - 3. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
  - 4. Mold and Microbial Resistance: Highly resistant when tested in accordance with ASTM D6329; certified in accordance with UL 2824.
  - 5. VOC Content Limits: As specified in Section 01 6116.
  - 6. Square Tile Size: 12 by 12 inch.
  - 7. Total Thickness: 0.125 inch.
  - 8. Color: To be selected by Architect from manufacturer's full range.
    - a. TARKETT, VCT II, COLOR: 509 PEWTER, SIZE 12" x 12"
    - b. TARKETT, VCT II, COLOR: 580 MINERAL WHITE, SIZE 12" x 12"
    - c. TARKETT, VCT II, COLOR: 500 BUTTERMILK, SIZE 12" x 12"
    - d. TARKETT, VCT II, COLOR: 526 GREEN GRAPE, SIZE 12" x 12"
- C. Feature Strips: Of same material as tile, as indicated on drawings inch wide.

## 2.05 STAIR COVERING

- A. Stair Treads: Rubber; full width and depth of stair tread in one piece; tapered thickness.
- B. Rubber Tread System by Roppe Corporation as listed on finish schedule with special provisions.
  - 1. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available and can work seamlessly with Basis of Design).
    - a. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
    - b. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - c. Roppe Corporation; Rubber Stair Treads: [www.roppe.com/#sle](http://www.roppe.com/#sle).
    - d. SHAW CONTRACT
  - 2. Minimum Requirements: Comply with ASTM F2169, Type TP, rubber, thermoset.
  - 3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
  - 4. Nosing: Square.
  - 5. Striping: 2 inch wide contrasting color abrasive strips.

6. Pattern and Color: As indicated on drawings.
  - a. ROPPE, RUBBER TREAD, #96 RAISED CIRCULAR VANTAGE, DESIGN WITH RISER. COLOR: 123 CHARCOAL
  - b. USE ROPPE, RUBBER NOSING AT FIRST STEP: #1 COMMERCIAL, STAIR NOSING, COLOR: 123 CHARCOAL
  
- C. Stair Treads: Rubber with interwoven synthetic fibers; full width and depth of stair tread in one piece; tapered thickness.
  1. Manufacturers: as indicated on drawings.
    - a. Roppe Corporation; Rubber Treads With DuPont Kevlar: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Nosing: Square.
  
- D. Stair Risers: Full height and width of tread in one piece, matching treads in material and color.
  1. Manufacturers: Roppe Corporation as indicated on drawings; subject to compliance with requirements and only if basis of design products are not readily available:
    - a. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
    - b. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - c. Roppe Corporation: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Thickness: 0.080 inch.
  
- E. Stair Treads with Integral Risers: Rubber; full height of riser, full width and depth of tread in one piece; tapered thickness.
  1. Manufacturers: Roppe Corporation as indicated on drawings and subject to compliance with requirements and only if basis of design products are not readily available:
    - a. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
    - b. Johnsonite, a Tarkett Company: [www.johnsonite.com](http://www.johnsonite.com).
    - c. Roppe Corporation: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Nosing: Square.
  3. Striping: 2 inch wide contrasting color abrasive strips.
  4. Tread Texture: Smooth.
  5. Color: As indicated on drawings.
  
- F. Stair Stringers: Full height in one piece and in maximum available lengths, matching treads in material and color.
  1. Manufacturers:
    - a. Roppe Corporation; \_\_\_\_\_: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Nominal Thickness: 0.080 inch.
  
- G. Stair Nosings: 1-1/2 inch horizontal return, 1-1/8 inch vertical return, full width of stair tread in one piece.
  1. Manufacturers:
    - a. Roppe Corporation: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Material: Rubber.
  3. Color: To match stair treads.

## 2.06 RESILIENT BASE

- A. Resilient Base - Type as indicated on drawings: ASTM F1861, Type TS rubber, vulcanized thermoset; style as scheduled.
  1. Basis-of-Design Product: Subject to compliance with requirements, provide Roppe Corporation Pinnacle Rubber Wall Base.
  2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS - PACKAGE #2

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RESILIENT FLOORING

- a. Armstrong Flooring, Inc.
  - b. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
  - c. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
  - d. Roppe Corporation; Contours Profiled Wall Base System: [www.roppe.com/#sle](http://www.roppe.com/#sle).
- 3. Type: Coved
  - 4. Height: 6 inch.
  - 5. Thickness: 0.125 inch.
  - 6. Finish: Satin.
  - 7. Length: Roll.
  - 8. Corners: Inside Corners and Outside Corners
  - 9. Color: As indicated on drawings.
    - a. PINNACLE RUBBER BASE, STANDARD TOE, 6" HIGH, COLOR: 123 Charcoal
    - b. PINNACLE RUBBER BASE, STANDARD TOE, 6" HIGH, COLOR: 100 Black
    - c. PINNACLE RUBBER BASE, STANDARD TOE, 6" HIGH, COLOR: 140 Fawn
  - 10. For top set wall base: Provide 1/8 in. thick, 6 in. high Roppe Corporation Flooring Color-Integrated Wall Base with a matte finish, conforming to ASTM F 1861, Type TP - Rubber, Thermoplastic, Group 1 - Solid, Style B – Cove.
  - 11. Accessories: Premolded external corners and internal corners.
  - 12. Products listed on drawings:
    - a. PINNACLE RUBBER BASE, STANDARD TOE, 6" HIGH

## 2.07 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
  - 1. VOC Content Limits: As specified in Section 01 6116.
- C. Adhesive for Vinyl Flooring:
  - 1. Provide compatible adhesives as recommended by Basis of Design products listed on drawings from the following manufacturer: Armstrong Flooring, Inc.
  - 2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).
    - a. H.B. Fuller Construction Products, Inc; TEC Flexera Premium Universal Adhesive: [www.tecspecialty.com/#sle](http://www.tecspecialty.com/#sle).
    - b. Loba-Wakol, LLC; WAKOL D 3120 PVC Adhesive: [www.loba-wakol.com/#sle](http://www.loba-wakol.com/#sle).
    - c. Stauf USA, LLC; D737 High-Tack: [www.staufusa.com/#sle](http://www.staufusa.com/#sle).
- D. Moldings, Transition and Edge Strips: Same material as flooring.
  - 1. Provide Basis of Design products listed on drawings from the following manufacturer: Armstrong Flooring, Inc.
  - 2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).
    - a. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
- E. Filler for Coved Base: Plastic.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine substrates, with Installer and the Manufacturer's Representative present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- C. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
- E. Proceed with installation only after unsatisfactory conditions have been corrected.
  - 1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

### 3.02 PREPARATION

- A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI (RWP).
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- D. Concrete Substrates: Prepare according to ASTM F 710.
  - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  - 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
  - 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
  - 4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
    - a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
    - b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

- E. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- F. Prohibit traffic until filler is fully cured.
- G. Clean substrate before and after the following:
- H. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- I. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
  - 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
- J. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.
- K. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

### 3.03 Installation - General

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Adhesive-Applied Installation:
  - 1. Spread only enough adhesive to permit installation of materials before initial set.
  - 2. Place copper grounding strip in conductive adhesive and apply additional adhesive to top side of strip before installing static control flooring. Allow strip to extend beyond flooring in accordance with static control flooring manufacturer's instructions. Refer to Section 26 0526 for grounding and bonding to building grounding system.
  - 3. Fit joints and butt seams tightly.
  - 4. Set flooring in place, press with heavy roller to attain full adhesion.
- D. Loose-Laid Installation: Set flooring in place in accordance with manufacturer's instructions.
- E. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- F. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
  - 1. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
  - 2. Resilient Strips: Attach to substrate using adhesive.
- G. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- H. Install flooring in recessed floor access covers, maintaining floor pattern.
- I. At movable partitions, install flooring under partitions without interrupting floor pattern.
- J. Install feature strips where indicated.



3.04 Installation - Sound Control Underlayment

- A. Install in accordance with underlayment manufacturer's instructions.

3.05 Installation - Sheet Flooring

- A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.
- B. Seams are prohibited in bathrooms, kitchens, toilet rooms, and custodial closets.
- C. Cut sheet at seams in accordance with manufacturer's instructions.
- D. Seal seams by heat welding where indicated.
- E. Coved Base: Install as detailed on drawings, using coved base filler as backing at floor to wall junction. Extend sheet flooring vertically to height indicated, and cover top edge with metal cap strip.

3.06 Installation - Tile Flooring

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
  - 1. Lay tiles in pattern indicated on drawings.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
  - 1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern).
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. General Requirements for Tile and Plank Installation as follows:

- J. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
- K. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.
- L. Install square tile to ashlar pattern. Allow minimum 1/2 full size tile width at room or area perimeter.
- M. Install loose-laid tile, fit interlocking edges tightly.
- N. Install loose-laid tile using interlocking pins to secure tiles to each other.
- O. Install plank tile with a random offset of at least 6 inches from adjacent rows.

### 3.07 Installation - Resilient Base

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

### 3.08 Installation - Stair Coverings

- A. Install stair coverings in one piece for full width and depth of tread.
- B. Install stringers configured tightly to stair profile.
- C. Adhere over entire surface. Fit accurately and securely.

### 3.09 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.
- C. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- D. Perform the following operations immediately after completing floor tile installation:
  1. Remove adhesive and other blemishes from surfaces.
  2. Sweep and vacuum surfaces thoroughly.
  3. Damp-mop surfaces to remove marks and soil.
  4. Apply 3 to 5 coats of high-quality commercial floor polish, such as Armstrong Flooring S-480 Commercial Floor Polish. If the floor has already been stripped (due to construction traffic), the application of a stain resistant sealer (such as Armstrong Flooring S-495 Commercial Floor Sealer) prior to the application of polish, is recommended in areas that will be exposed to heavy traffic and/or staining agents.
- E. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- F. Cover floor tile until Substantial Completion.

- G. Manufacturer's Field Representation to include providing cleaning and maintenance training and demonstration to Philadelphia Parks and Recreation Department's staff. Manufacturer's Representative to confirm in writing that the installation meets manufacturer's installation and cleaning

3.10 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.11 SCHEDULE

- A. As indicated on drawings.

END OF SECTION 09 6500

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## SECTION 09 6500 RESILIENT FLOORING

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Resilient Wall Base as shown on drawings and listed in Finish Schedule.
- B. Resilient Tile Flooring as shown on drawings and listed in Finish Schedule.
- C. Resilient Rubber Wall Base as shown on drawings and listed in Finish Schedule.
- D. Preformed Resilient Stair Accessories as shown on drawings and listed in Finish Schedule.
- E. Installation Accessories as required to provide basis of design complete installations.

#### 1.02 RELATED REQUIREMENTS

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 09 0561 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.

#### 1.03 REFERENCE STANDARDS

- A. ASTM D6329 - Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers 1998 (Reapproved 2015).
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- C. ASTM E492 - Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine 2009, with Editorial Revision (2016).
- D. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source 2019a, with Editorial Revision (2020).
- E. ASTM E2179 - Standard Test Method for Laboratory Measurement of the Effectiveness of Floor Coverings in Reducing Impact Sound Transmission Through Concrete Floors 2021.
- F. ASTM F150 - Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring 2006 (Reapproved 2018).
- G. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring 2021.
- H. ASTM F970 - Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading 2017.
- I. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile 2004 (Reapproved 2018).

- J. ASTM F1303 - Standard Specification for Sheet Vinyl Floor Covering with Backing 2004 (Reapproved 2021).
- K. ASTM F1344 - Standard Specification for Rubber Floor Tile 2021a.
- L. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile 2020.
- M. ASTM F1859 - Standard Specification for Rubber Sheet Floor Covering Without Backing 2021a.
- N. ASTM F1861 - Standard Specification for Resilient Wall Base 2021.
- O. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride 2016a.
- P. ASTM F1913 - Standard Specification for Vinyl Sheet Floor Covering Without Backing 2019.
- Q. ASTM F2034 - Standard Specification for Sheet Linoleum Floor Covering 2018.
- R. ASTM F2169 - Standard Specification for Resilient Stair Treads 2015 (Reapproved 2020).
- S. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes 2019a.
- T. ASTM F2195 - Standard Specification for Linoleum Floor Tile 2018.
- U. ASTM F2982 - Standard Specification for Polyester Composition Floor Tile 2018.
- V. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source 2023.
- W. NSF 332 - Sustainability Assessment for Resilient Floor Coverings 2015.
- X. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings 2011.
- Y. UL 2824 - GREENGUARD Certification Program Method for Measuring Microbial Resistance From Various Sources Using Static Environmental Chambers Current Edition, Including All Revisions.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Shop Drawings: Indicate seaming plans and floor patterns.
  - 1. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
  - 2. Show details of special patterns.
- D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
  - 1. Samples: Full-size units of each color, texture, and pattern of floor tile required.
  - 2. Samples for Initial Selection: For each type of floor tile indicated.
  - 3. Samples for Verification: Full-size units of each color and pattern of floor tile required.
  - 4. Product Schedule: For floor tile. Use same designations indicated on Drawings.

- E. Verification Samples: Submit two samples, 6 by 6 inch in size illustrating color and pattern for each resilient flooring product specified.
- F. Sustainable Design Submittal: Submit VOC content documentation for flooring and adhesives.
- G. Concrete Subfloor Test Report: Submit a copy of the moisture and alkalinity (pH) test reports.
- H. Certification: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of subfloor is acceptable.
- I. Manufacturer's Qualification Statement.
- J. Installer's Qualification Statement.
- K. Closeout Submittals: Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.
- L. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  1. See Section 01 6000 - Product Requirements, for additional provisions.
  2. Extra Flooring Material: 6 square feet of each type and color.
  3. Extra Wall Base: 24 linear feet of each type and color.
  4. Extra Stair Materials: Quantity equivalent to 5 percent of each type and color.
  5. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  6. Floor Tile: Furnish one box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring with minimum three years documented experience ;Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required. .
- C. Testing Agency Qualifications: Independent firm specializing in performing concrete slab moisture testing and inspections of the type specified in this section.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- D. Protect roll materials from damage by storing on end.
- E. Do not double stack pallets.
- F. Store floor tile and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F. Store floor tiles on flat surfaces. Store flooring, adhesives and

accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

#### 1.07 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.
- B. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 95 deg F, in spaces to receive floor tile during the following periods:
  - 1. 48 hours before installation.
  - 2. During installation.
  - 3. 48 hours after installation.
- C. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- D. Close spaces to traffic during floor tile installation.
- E. Close spaces to traffic for 48 hours after floor tile installation.
- F. Install floor tile after other finishing operations, including painting, have been completed.

#### PART 2 PRODUCTS

##### 2.01 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient floor tile, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
  - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
  - 2. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less

##### 2.02 RESILIENT FLOOR TILE MATERIALS

- A. Manufacturers: Basis of Design provide products by Armstrong Flooring, Inc. UNO
  - 1. Other manufactures subject to compliance with requirements, products by one of the following manufacturers may be submitted under the provisions of Division 01, Substitution Procedures.
- B. Basis of Design: Striations BBT and Migrations BBT Bio-Flooring manufactured by Armstrong.
  - 1. Description: Tile composed of polyester resin binder, fillers and pigments with colors and pattern dispersed uniformly throughout its thickness.
  - 2. Bio-flooring tile shall conform to the requirements of ASTM F 2982 Standard Specification for Polyester Composition Floor Tile. Note: Striations BBT™ and Migrations® BBT™ Bio-flooring's unique binder system does not contain polyvinyl chloride resins and plasticizers.
  - 3. Size: as indicated on drawing and typically 12 in. x 12 in. UNO and 12 in. x 24 in.
  - 4. Thickness: 1/8"/0.125 in. (3.2mm)
- C. Colors and Patterns: to be selected from manufacturer's color options and per floor patterns shown in drawings.



## 2.03 RESILIENT RUBBER STRAIGHT WALL BASE

- A. Use Resilient Rubber Wall Base as shown on drawings as listed in Finish Schedule.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Johnsonite Rubber Wall Base.
- C. Meet requirements for Rubber Base define elsewhere in this section.
- D. Provide as basis of design:
  - 1. Johnsonite Baseworks™ Thermoset Rubber (Type TS), Toeless, 4"high, color 40 black.
- E. Or Apporved Equal.

## 2.04 RESILIENT RUBBER VENT COVE WALL BASE.

- A. Use Resilient Rubber Wall Base as shown on drawings in both Gyms as listed in Finish Schedule.
- B. Basis-of-Design Product: Subject to compliance with requirements, provide Tarkett Traditional Thermoplastic Rubber Wall Base.
  - 1. Tarkett North America
  - 2. Phone: (800) 899-8916
  - 3. 30000 Aurora Rd. Solon, Ohio 44139
  - 4. Web: [www.tarkettna.com](http://www.tarkettna.com) E-mail: [info@tarkett.com](mailto:info@tarkett.com)
- C. Performance requirements meets ASTM F1861 Standard Specification for Resilient Thermoplastic Rubber Wall Base, Type TP, Group 1.
- D. Thickness: 0.125" (3.17 mm)
- E. Type: VENT COVE BASE 4" high x 3",
- F. Height: 4"
- G. Roll length: 100' (30.48 m)
- H. Corners: Inside Corners and Outside Corners
- I. Colors and Patterns: As selected by Architect from full range of industry colors.
- J. Test Data:
  - 1. Flexibility, ASTM F137: Passes 1/4 inch mandrel
  - 2. Resistance to light, ASTM F1515: Passes
  - 3. Resistance to chemicals, ASTM F925: Passes
  - 4. ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm<sup>2</sup> or greater, Class 1.

## 2.05 TILE FLOORING

- A. Vinyl Composition Tile - Type as indicated on drawings: Homogeneous, with color extending throughout thickness.
  - 1. Provide Basis of Design products listed on drawings from the following manufacturer: Johnsonite, a Tarkett Company.

2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).
    - a. Armstrong Flooring, Inc; Excelon SDT: [www.armstrongflooring.com/#sle](http://www.armstrongflooring.com/#sle).
    - b. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - c. Substitutions: See Section 01 6000 - Product Requirements.
  3. Minimum Requirements: Comply with ASTM F1066, of Class corresponding to type specified.
  4. Size: 12 by 12 inch or as indicated on drawings.
  5. VOC Content Limits: As specified in Section 01 6116.
  6. Thickness: 0.125 inch.
  7. Pattern and Color: As indicated on drawings.
    - a. TARKETT, VCT II, COLOR: 509 PEWTER, SIZE 12" x 12"
    - b. TARKETT, VCT II, COLOR: 580 MINERAL WHITE, SIZE 12" x 12"
    - c. TARKETT, VCT II, COLOR: 500 BUTTERMILK, SIZE 12" x 12"
    - d. TARKETT, VCT II, COLOR: 526 GREEN GRAPE, SIZE 12" x 12"
- B. Vinyl Tile - Type as indicated on drawings: Solid vinyl with color and pattern throughout thickness.
1. Provide Basis of Design products listed on drawings from the following manufacturer: Johnsonite, a Tarkett Company.
  2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).
    - a. Armstrong Flooring Inc; Natural Creations with Diamond 10 Technology ArborArt: [www.armstrong.com/#sle](http://www.armstrong.com/#sle).
    - b. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
    - c. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - d. LG Hausys America, Inc; : [www.lghausysusa.com/#sle](http://www.lghausysusa.com/#sle).
    - e. Metroflor Corporation; Aspecta Five LVT: [www.aspecta flooring.com/#sle](http://www.aspecta flooring.com/#sle).
    - f. Roppe Corporation: [www.roppe.com/#sle](http://www.roppe.com/#sle).
    - g. Shannon Specialty Floors, Inc; Tuf Stuf T3 Luxury Vinyl Tile: [www.shannonspecialtyfloors.com/#sle](http://www.shannonspecialtyfloors.com/#sle).
    - h. Substitutions: See Section 01 6000 - Product Requirements.
  3. Minimum Requirements: Comply with ASTM F1700, of Class corresponding to type specified.
  4. Mold and Microbial Resistance: Highly resistant when tested in accordance with ASTM D6329; certified in accordance with UL 2824.
  5. VOC Content Limits: As specified in Section 01 6116.
  6. Square Tile Size: 12 by 12 inch.
  7. Total Thickness: 0.125 inch.
  8. Color: To be selected by Architect from manufacturer's full range.
    - a. TARKETT, VCT II, COLOR: 557 Shooting star, SIZE 12" x 12"
    - b. TARKETT, VCT II, COLOR: 580 MINERAL WHITE, SIZE 12" x 12"
    - c. TARKETT, VCT II, COLOR: 500 BUTTERMILK, SIZE 12" x 12"
    - d. TARKETT, VCT II, COLOR: 526 GREEN GRAPE, SIZE 12" x 12"
- C. Feature Strips: Of same material as tile, as indicated on drawings inch wide.

## 2.06 STAIR COVERING

- A. Stair Treads: Rubber; full width and depth of stair tread in one piece; tapered thickness.
- B. Rubber Tread System by Roppe Corporation as listed on finish schedule with special provisions.

1. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available and can work seamlessly with Basis of Design).
    - a. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
    - b. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - c. Roppe Corporation; Rubber Stair Treads: [www.roppe.com/#sle](http://www.roppe.com/#sle).
    - d. SHAW CONTRACT
  2. Minimum Requirements: Comply with ASTM F2169, Type TP, rubber, thermoset.
  3. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E648 or NFPA 253.
  4. Nosing: Square.
  5. Striping: 2 inch wide contrasting color abrasive strips.
  6. Pattern and Color: As indicated on drawings.
    - a. ROPPE, RUBBER TREAD, #96 RAISED CIRCULAR VANTAGE, DESIGN WITH RISER. COLOR: 123 CHARCOAL
    - b. USE ROPPE, RUBBER NOSING AT FIRST STEP: #1 COMMERCIAL, STAIR NOSING, COLOR: 123 CHARCOAL
- C. Stair Treads: Rubber with interwoven synthetic fibers; full width and depth of stair tread in one piece; tapered thickness.
1. Manufacturers: as indicated on drawings.
    - a. Roppe Corporation; Rubber Treads With DuPont Kevlar: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Nosing: Square.
- D. Stair Risers: Full height and width of tread in one piece, matching treads in material and color.
1. Manufacturers: Roppe Corporation as indicated on drawings; subject to compliance with requirements and only if basis of design products are not readily available:
    - a. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
    - b. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - c. Roppe Corporation: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Thickness: 0.080 inch.
- E. Stair Treads with Integral Risers: Rubber; full height of riser, full width and depth of tread in one piece; tapered thickness.
1. Manufacturers: Roppe Corporation as indicated on drawings and subject to compliance with requirements and only if basis of design products are not readily available:
    - a. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
    - b. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - c. Roppe Corporation: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Nosing: Square.
  3. Striping: 2 inch wide contrasting color abrasive strips.
  4. Tread Texture: Smooth.
  5. Color: As indicated on drawings.
- F. Stair Stringers: Full height in one piece and in maximum available lengths, matching treads in material and color.
1. Manufacturers:
    - a. Roppe Corporation; \_\_\_\_\_: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Nominal Thickness: 0.080 inch.
- G. Stair Nosings: 1-1/2 inch horizontal return, 1-1/8 inch vertical return, full width of stair tread in one piece.
1. Manufacturers:
    - a. Roppe Corporation: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  2. Material: Rubber.

3. Color: To match stair treads.

## 2.07 RESILIENT BASE

- A. Resilient Base - Type as indicated on drawings: ASTM F1861, Type TS rubber, vulcanized thermoset; style as scheduled.
  1. Basis-of-Design Product: Subject to compliance with requirements, provide Roppe Corporation Thermoplastic Vinyl Wall Base.
  2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).
    - a. Armstrong Flooring, Inc.
    - b. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
    - c. Johnsonite, a Tarkett Company: [www.johnsonite.com/#sle](http://www.johnsonite.com/#sle).
    - d. Roppe Corporation; Contours Profiled Wall Base System: [www.roppe.com/#sle](http://www.roppe.com/#sle).
  3. Type: Coved
  4. Height: 4 inch or as otherwise indicated on drawings.
  5. Thickness: 0.125 inch.
  6. Finish: Satin.
  7. Length: Roll.
  8. Corners: Inside Corners and Outside Corners
  9. Color: As indicated on drawings with typical height of 4" high unless noted otherwise shown on drawings.
    - a. PINNACLE RUBBER BASE, STANDARD TOE, 4" HIGH, COLOR: 123 Charcoal.
    - b. PINNACLE RUBBER BASE, STANDARD TOE, 4" HIGH, COLOR: 100 Black.
    - c. PINNACLE RUBBER BASE, STANDARD TOE, 4" HIGH, COLOR: 140 Fawn.
  10. Colors and Patterns: to be selected from manufacturer's color options.
    - a. PINNACLE RUBBER BASE, STANDARD TOE, 4" HIGH, COLOR: TBD.
  11. For top set wall base: Provide 1/8 in. thick, 4 in. high Roppe Corporation Flooring Color-Integrated Wall Base with a matte finish, conforming to ASTM F 1861, Type TP - Rubber, Thermoplastic, Group 1 - Solid, Style B – Cove.
  12. Accessories: Premolded external corners and internal corners.
  13. Products listed on drawings:
    - a. PINNACLE RUBBER BASE, STANDARD TOE, 4" HIGH.

## 2.08 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
  1. VOC Content Limits: As specified in Section 01 6116.
- C. Adhesive for Vinyl Flooring:
  1. Provide compatible adhesives as recommended by Basis of Design products listed on drawings from the following manufacturer: Armstrong Flooring, Inc.
  2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).
    - a. H.B. Fuller Construction Products, Inc; TEC Flexera Premium Universal Adhesive: [www.tecspecialty.com/#sle](http://www.tecspecialty.com/#sle).
    - b. Loba-Wakol, LLC; WAKOL D 3120 PVC Adhesive: [www.loba-wakol.com/#sle](http://www.loba-wakol.com/#sle).
    - c. Stauf USA, LLC; D737 High-Tack: [www.staufusa.com/#sle](http://www.staufusa.com/#sle).
- D. Moldings, Transition and Edge Strips: Same material as flooring.

1. Provide Basis of Design products listed on drawings from the following manufacturer: Armstrong Flooring, Inc.
  2. Manufacturers: (subject to compliance with requirements and only if basis of design products are not readily available).
    - a. Burke Flooring: [www.burkeflooring.com/#sle](http://www.burkeflooring.com/#sle).
- E. Filler for Coved Base: Plastic.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine substrates, with Installer and the Manufacturer's Representative present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
  1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.
- B. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- C. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
- E. Proceed with installation only after unsatisfactory conditions have been corrected.
  1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

### 3.02 PREPARATION

- A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI (RWP).
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- D. Concrete Substrates: Prepare according to ASTM F 710.
  1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
  2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
  3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
  4. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

- a. Anhydrous Calcium Chloride Test: ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
  - b. Relative Humidity Test: Using in-situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
- E. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
  - F. Prohibit traffic until filler is fully cured.
  - G. Clean substrate before and after the following:
  - H. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
  - I. Do not install floor tiles until materials are the same temperature as space where they are to be installed.
    - 1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.
  - J. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.
  - K. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.

### 3.03 Installation - General

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install in accordance with manufacturer's written instructions.
- C. Adhesive-Applied Installation:
  - 1. Spread only enough adhesive to permit installation of materials before initial set.
  - 2. Place copper grounding strip in conductive adhesive and apply additional adhesive to top side of strip before installing static control flooring. Allow strip to extend beyond flooring in accordance with static control flooring manufacturer's instructions. Refer to Section 26 0526 for grounding and bonding to building grounding system.
  - 3. Fit joints and butt seams tightly.
  - 4. Set flooring in place, press with heavy roller to attain full adhesion.
- D. Loose-Laid Installation: Set flooring in place in accordance with manufacturer's instructions.
- E. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- F. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
  - 1. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
  - 2. Resilient Strips: Attach to substrate using adhesive.
- G. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

- H. Install flooring in recessed floor access covers, maintaining floor pattern.
- I. At movable partitions, install flooring under partitions without interrupting floor pattern.
- J. Install feature strips where indicated.

#### 3.04 Installation - Sound Control Underlayment

- A. Install in accordance with underlayment manufacturer's instructions.

#### 3.05 Installation - Sheet Flooring

- A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.
- B. Seams are prohibited in bathrooms, kitchens, toilet rooms, and custodial closets.
- C. Cut sheet at seams in accordance with manufacturer's instructions.
- D. Seal seams by heat welding where indicated.
- E. Coved Base: Install as detailed on drawings, using coved base filler as backing at floor to wall junction. Extend sheet flooring vertically to height indicated, and cover top edge with metal cap strip.

#### 3.06 Installation - Tile Flooring

- A. Comply with manufacturer's written instructions for installing floor tile.
- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
  - 1. Lay tiles in pattern indicated on drawings.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
  - 1. Lay tiles with grain direction alternating in adjacent tiles (basket-weave pattern).
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

- H. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- I. General Requirements for Tile and Plank Installation as follows:
- J. Mix tile from container to ensure shade variations are consistent when tile is placed, unless otherwise indicated in manufacturer's installation instructions.
- K. Lay flooring with joints and seams parallel to building lines to produce symmetrical pattern.
- L. Install square tile to ashlar pattern. Allow minimum 1/2 full size tile width at room or area perimeter.
- M. Install loose-laid tile, fit interlocking edges tightly.
- N. Install loose-laid tile using interlocking pins to secure tiles to each other.
- O. Install plank tile with a random offset of at least 6 inches from adjacent rows.

### 3.07 Installation - Resilient Base

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

### 3.08 Installation - Stair Coverings

- A. Install stair coverings in one piece for full width and depth of tread.
- B. Install stringers configured tightly to stair profile.
- C. Adhere over entire surface. Fit accurately and securely.

### 3.09 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.
- C. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- D. Perform the following operations immediately after completing floor tile installation:
  1. Remove adhesive and other blemishes from surfaces.
  2. Sweep and vacuum surfaces thoroughly.
  3. Damp-mop surfaces to remove marks and soil.
  4. Apply 3 to 5 coats of high-quality commercial floor polish, such as Armstrong Flooring S-480 Commercial Floor Polish. If the floor has already been stripped (due to construction traffic), the application of a stain resistant sealer (such as Armstrong Flooring S-495 Commercial Floor Sealer) prior to the application of polish, is recommended in areas that will be exposed to heavy traffic and/or staining agents.



- E. Protect floor tile from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- F. Cover floor tile until Substantial Completion.
- G. Manufacturer's Field Representation to include providing cleaning and maintenance training and demonstration to Philadelphia Parks and Recreation Department's staff. Manufacturer's Representative to confirm in writing that the installation meets manufacturer's installation and cleaning

3.10 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.11 SCHEDULE

- A. As indicated on drawings.

END OF SECTION

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## SECTION 09 9000 PAINTS AND COATINGS

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- B. Division 32 for Handcourt and Other Sports Layout Painting

#### 1.02 SUMMARY

- A. Section Includes: Surface preparation and field painting of the following:
  - 1. Exposed exterior items and surfaces.
  - 2. Exposed interior items and surfaces.
  - 3. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
  - 4. Limited use of custom metallic paint as shown on drawings.
- B. Paint exposed surfaces, except where the paint schedules indicate that a surface or material is not to be painted or is to remain natural. If the paint schedules do not specifically mention an item or a surface, paint the item or surface the same as similar adjacent materials or surfaces whether or not schedules indicate colors. If the schedules do not indicate color or finish, the Architect will select from standard colors and finishes available.
  - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- C. Exterior Painting General Note: All Exterior exposed ferrous metal surfaces to be painted except for stainless steel items and unless noted otherwise. Anodized aluminum surfaces are not to be painted; and galvalume roofing materials are to be supplied with manufacturer's finishes and are not to be painted. Use anti-graffiti coatings and Low VOC paints. Follow Philadelphia Parks and Rec Paint Color Guide as selected by architect.
  - 1. Shop Prepping, Priming and High Performance Coating of all Stainless Steel Doors and Frames.
  - 2. After complete curing, wrap and protect items for shipping and site storage; do not remove wrapping until after all work is complete and with approval from Owner.
  - 3. Exterior Painting for painting of existing concrete wall at handball courts and painting/priming of exterior guardrail/handrails as required by Basis of Design Paint Manufacturer.
- D. Interior Painting General Note: all shall be Low or no VOC. Follow Philadelphia Parks and Rec Paint Color Guide as selected by architect.
- E. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
  - 1. Prefinished items include the following factory-finished components:
    - a. Toilet compartments.
    - b. Prefinished lockers.
    - c. Finished mechanical and electrical equipment.
    - d. Light fixtures.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:
  - a. Foundation spaces.
  - b. Furred areas.
  - c. Ceiling plenums.
  - d. Utility tunnels.
  - e. Pipe spaces.
  - f. Duct shafts.
3. Finished metal surfaces include the following:
  - a. Anodized aluminum.
  - b. Stainless steel.
  - c. Chromium plate.
  - d. Copper.
  - e. Bronze and brass.
4. Operating parts include moving parts of operating equipment and the following:
  - a. Valve and damper operators.
  - b. Linkages.
  - c. Sensing devices.
  - d. Motor and fan shafts.
5. Labels: Do not paint over Underwriters Laboratories (UL), Factory Mutual (FM), or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
6. Masonry: Do not paint over Terracotta, Stone and Brick Masonry and Glazed and Decorative CMU.

F. Related Sections:

1. Section 04 200 "Unit Masonry" for shaft work
2. Section 055000 "Metal Fabrications".
3. Section 055100 "Metal Stairs"
4. Section 062000 "Finish Carpentry"
5. Section 064100 "Architectural Wood Casework"
6. Section 081113 "Hollow Metal Doors and Frames"
7. Section 083113 "Access Doors and Panels"
8. Section 092500 "Gypsum Board"
9. Section 096200 "Resinous Poured in Place Resilient Flooring"

1.03 SUBMITTALS

- A. Product Data: For each paint system specified. Include block fillers and primers.
- B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of finish-coat material indicated.
- C. Samples for Verification: Of each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
  1. Provide a list of materials and applications for each coat of each sample. Label each sample for location and application.
- D. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

#### 1.04 QUALITY ASSURANCE

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers, primers, and undercoat materials for each coating system from the same manufacturer as the finish coats.

#### 1.05 PRODUCT HANDLING

- A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
  - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

#### 1.06 PROJECT CONDITIONS

- A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 deg F.
- B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 and 95 deg F.
- C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
  - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.
- D. Provide adequate ventilation, including mechanical ventilation, to remove paint odors and fumes from areas of the building where odors might migrate to occupied spaces.

#### 1.07 EXTRA MATERIALS

- A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage and identify with labels describing contents. Deliver extra materials to area designated by Owner.
  - 1. Quantity: Furnish the Owner with an additional 5 percent, but not less than 1 gal. or 1 case, as appropriate, of each material and color applied.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Provide Basis of Design products listed on drawings and schedule within are from the following manufacturer: Sherwin Williams Company (S-W).

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PAINTS AND COATINGS

- B. Products: Subject to compliance with requirements, provide one of the products in the paint schedules, or an approved equal product of another acceptable manufacturer and only if basis of design products are not readily available.
- C. Manufacturers Names: The following manufacturers are referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:
  1. Sherwin Williams Company (S-W).
  2. Benjamin Moore (B-M).
  3. PPG Industries, Inc (PPG).

## 2.02 PAINT MATERIALS, GENERAL

- A. VOC Emissions for Interior Paints and Coating: Provide certificate of compliance with California Department of Public Health (CDPH) Standard Method v1.1-2010, using the applicable exposure scenario.
- B. VOC Content for Interior Paints and Coatings: Provide documentation of compliant VOC contender per SCAQMD Rule 1113.
- C. Material Compatibility:
  1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
  2. For each coat in a coating system, provide products recommended in writing by manufacturers of topcoat for use in coating system and on substrate indicated.
- D. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:
  1. Flat Paints, Coatings, and Primers: VOC content of not more than 50 g/L.
  2. Nonflat Paints, Coatings, and Primers: VOC content of not more than 150 g/L.
  3. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
  4. Wood stain and clear finish: VOC content not more than 350 g/L.
  5. Floor Coatings: VOC not more than 100 g/L.
- E. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
  1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- F. Colors: Provide color selections made by the Architect from manufacturer's full range of available colors. Where directed, provide custom colors of the finished paint systems to match the Architect's samples.
- G. Exposed Galvanized Steel Surfaces:
  1. Basis of Design Primer for stained ferrous metal spot prime using: S-W Pro Industrial Pro-Cryl Universal Acrylic Primer.
  2. Basis of Design for Paint on galvanized metal: S-W Pro Industrial Waterborne Acrylic Dryfall.
  3. Exposed underside of galvanized roof deck and other galvanized steel surfaces:

- H. Stainless Steel Doors and Frames indicated to receive High Performance Coatings:
1. Refer to drawings and paint schedule and as follows:
  2. Basis of design for High Performance Coating of Stainless Steel Doors and Frames:
    - a. SW products to be shop applied strictly following manufacturers requirements:
    - b. Prep to comply with SSPC-SP6/NACE 3
    - c. Primer: Recoatable Epoxy Primer
    - d. 2 Coats: Hi-Solids Polyurethane
  3. Primers on stainless steel require shop prep to meet the requirements of following for the removal of all oil and grease from surface by Solvent Cleaning per:
    - a. SSPC-SP 16 in general
    - b. SSPC-SP6/NACE 3 per basis of design
    - c. SSPC-SP2 and SSPC-SP1 will only be considered with special approval from primer manufacturers and Owner special approval to use Macropoxy 5000 and Acrolon 218 HS due to extraordinary field conditions.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
1. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
  2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

#### 3.02 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of the size or weight of the item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Preparing Previously Painted Wood Surfaces: Remove existing paint from wood surfaces using scrapers or chemical paint stripper as follows:
1. Strip loose, chipped, alligatored or otherwise deteriorated paint using methods that will not damage existing woodwork.
  2. Remove paint to sound substrate. Sound, well-adhered paint may remain on surface.
  3. Allow surfaces to dry and sand smooth.
  4. Clean surfaces so they are free of dust and dirt.
  5. Fill cracks, gouges and nail holes with wood filler prior to application of first coat.
  6. Complete surface preparation to produce a smooth, uniform substrate suitable for application of primer and finish coats specified.

- C. Preparing Previously Painted Metal Surfaces: Remove existing paint from ferrous metal surfaces as follows:
1. Scrape to remove paint, exercising care not to damage metalwork.
  2. Following paint stripping, rub steel surfaces to remove rust bloom, and solvent clean prior to priming. Ferrous metal surfaces may be rinsed with water.
  3. Prior to application of finish materials, clean all surfaces so they are free of dust and dirt.
  4. Following initial priming, fill gouges, holes and other surface imperfections with epoxy filler. Spot prime filled areas and allow to dry prior to application of first finish coat.
- D. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease before cleaning.
1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
  2. Primers on stainless steel require shop prep to meet the requirements of primer manufacturers and following for the removal of all oil and grease from surface by Solvent Cleaning: SSPC-SP6/NACE 3.
- E. Stainless Steel Doors and Frames to be rewrapped:
1. After Shop Painting and after fully cured, rewrap each door and frame separately and match each door to its frame and box together for shipment to the field.
- F. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
1. Provide barrier coats over incompatible primers or remove and re-prime.
  2. Cementitious Materials: Prepare concrete and masonry surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
    - a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
    - b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's written instructions.
    - c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
  3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
    - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    - b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
  4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with the Steel Structures Painting Council's (SSPC) recommendations.
    - a. Blast steel surfaces clean as recommended by paint system manufacturer and according to requirements of SSPC-SP 10.
    - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.



- c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.
- 5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- G. Materials Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
  - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
  - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
  - 3. Use only thinners approved by paint manufacturer and only within recommended limits.
- H. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

### 3.03 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
  - 1. Surface treatments and finishes are indicated in the schedules.
  - 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
  - 3. Provide finish coats that are compatible with primers used.
  - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, covers for finned-tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
  - 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
  - 6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
  - 7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
  - 8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
  - 9. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
  - 1. The number of coats and the film thickness required are the same regardless of application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
  - 2. Omit primer on metal surfaces that have been shop primed and touchup painted.
  - 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for the type of material applied. Use brush of appropriate size for the surface or item being painted.
  2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
  3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
  4. Block Filler on CMU: Follow Manufacturer's recommendations - squeegee block filler to force material into pores in order to produce a relatively smooth surface. In wet areas, a smooth continuous pinhole-free appearance is necessary for proper protection before top-coating and require two coats to provide most uniform surface.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.
- E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and in occupied spaces.
- F. Mechanical items to be painted by General Contractor to include, but are not limited to, the following:
1. Piping, pipe hangers, and supports.
  2. Tanks.
  3. Exposed ductwork.
  4. Insulation.
  5. Supports.
  6. Motors and mechanical equipment.
  7. Accessory items.
- G. Electrical items to be painted include, but are not limited to, the following:
1. Conduit and fittings.
  2. Panelboards.
- H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
1. Squeegee block filler to force material into pores in order to produce a relatively smooth surface. A smooth continuous pinhole-free appearance is necessary for proper protection before topcoating and require two coats to provide most uniform surface. Spotting, laps, roller marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- I. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or other defects due to insufficient sealing.
- J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

- K. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

### 3.04 FIELD QUALITY CONTROL

- A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:
  - 1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.
  - 2. The testing agency will perform appropriate tests for the following characteristics as required by the Owner:
    - a. Quantitative material analysis.
    - b. Abrasion resistance.
    - c. Apparent reflectivity.
    - d. Flexibility.
    - e. Washability.
    - f. Absorption.
    - g. Accelerated weathering.
    - h. Dry opacity.
    - i. Accelerated yellowness.
    - j. Recoating.
    - k. Skinning.
    - l. Color retention.
    - m. Alkali and mildew resistance.
  - 3. The Owner may direct the Contractor to stop painting if test results show material being used does not comply with specified requirements. The Contractor shall remove noncomplying paint from the site, pay for testing, and repaint surfaces previously coated with the rejected paint. If necessary, the Contractor may be required to remove rejected paint from previously painted surfaces if, on repainting with specified paint, the 2 coatings are incompatible.

### 3.05 CLEANING AND PROTECTION

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
  - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.
- B. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- C. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
  - 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

### 3.06 EXTERIOR PAINT SCHEDULE

- A. General: Provide the finish systems scheduled for each material type indicated, applied at spreading rate recommended by manufacturer to achieve the total dry film thickness (DFT) listed.

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS - PACKAGE #2

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PAINTS AND COATINGS

1. Provide 2 finish coats over the listed base coats (primer, filler, bond coat) except as otherwise indicated.
- B. Exterior Ferrous Metal:
1. Semigloss, Acrylic-Enamel Finish:
    - a. Primer: 1.3 mils DFT.
      - 1) Corrosion Fighting Primer.
        - a) S-W: Rust-O-Lastic Anti-Corrosive Primer.
        - b) B-M: IronClad Retardo Rust-Inhibitive Paint #163.
        - c) PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.
    - b. First and Second Coats: 2.6 mils DFT.
      - 1) S-W: House & Trim Acrylic Semi-Gloss Enamel.
      - 2) B-M: MoorGlo Latex House & Trim Paint #096.
      - 3) PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.
- C. Exterior Zinc-Coated Metal:
1. Semigloss, Acrylic-Enamel Finish:
    - a. Pretreatment Surface Preparation: As recommended by coating manufacturer.
    - b. Primer: 1.2 mils DFT.
      - 1) S-W: Rust-O-Lastic Hydro-Prime II.
      - 2) B-M: IronClad Galvanized Metal Latex Primer #155.
      - 3) PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.
    - c. First and Second Coats: 2.6 mils DFT.
      - 1) S-W: Sea Shore/Four Seasons Acrylic Trim Enamel.
      - 2) B-M: MoorGlo Latex House & Trim Paint #096.
      - 3) PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.

### 3.07 INTERIOR PAINT AND COATING SCHEDULE

- A. General: Provide the finish systems scheduled for each material type indicated, applied at spreading rate recommended by manufacturer to achieve the total dry film thickness (DFT) listed.
1. Provide 2 finish coats over the listed base coats (primer, filler, bond coat) except as otherwise indicated.
  2. See Finish Schedule on drawings for location of paint and coating types.
- B. Interior Concrete; Non-Traffic Surfaces:
1. Water-Reducible Epoxy Coating System:
    - a. Primer or Filler: As recommended by coating manufacturer.
    - b. First and Second Coats:
      - 1) S-W: Water Based Catalyzed Epoxy, 3.0 mils DFT. Semi-Gloss, 051 Line; 2.0 mils DFT.
      - 2) B-M: Corotech High Performance Clear Acrylic Sealer, Low Lustre V027; 1.5 mils DFT.
      - 3) PPG: Pitt-Glaze WB1 Interior Pre-Catalyzed Acrylic Water Borne Epoxy, eggshell; 1.5 mils DFT.
- C. Interior Concrete; Traffic Surfaces:
1. Urethane Finish with Slip-Resistant Aggregate Finish: For mechanical room, technology room, and electrical room.
    - a. First and Second Coats: water-based urethane.
      - 1) S-W: Moisture Cured Urethane Pigmented: 2 coats SW ArmorSeal Rextthane1 with non-skid additive.

- 2) B-M:
      - 3) PPG:
    - b. Color: Architect to select from full range of colors.
  - 2. Epoxy Finish: For storage rooms.
    - a. Primer: Latex sealer undercoat.
    - b. First Coat: Latex enamel.
    - c. Second Coat: Two-component, high build epoxy.
      - 1) S-W:
      - 2) B-M:
      - 3) PPG:
- D. Interior Concrete Masonry Units (CMU); Location as indicated on drawings:
1. High-Performance, Interior/Exterior Polyamine Epoxy Coating System: Total system thickness not less than 10 mils DFT.
    - a. Block Filler Coat:
      - 1) Basis of Design: Sherwin Williams Pro Industrial Heavy Duty Block Filler B42W150.
      - 2) Approved equivalent by one of the following:
        - a) B-M:
        - b) PPG: 97-685/97-686 Aquapon Polyamide-Epoxy Block Filler.
    - b. First and Second Coats:
      - 1) Basis of Design: S-W Pro Industrial Water Based Catalyzed Epoxy.
      - 2) Approved equivalent by one of the following:
        - a) PPG: 97-1 Series Aquapon Polyamide-Epoxy.
        - b) B-M: Ironclad Chemical and Water Resistant Epoxy Enamel 182.
- E. Interior Gypsum Board:
1. Water-Reducible Epoxy Coating System:
    - a. Primer:
      - 1) S-W: PrepRite 200 Latex Primer; 1.4 mils DFT.
      - 2) PPG:TCD Acrylic Primer Sealer; 1.5 mils DFT.
      - 3) B-M:Rich Lux Latex Sealer Undercoater 037-154; 1.5 mils DFT.
    - b. First and Second Coats:
      - 1) S-W:Water Based Catalyzed Epoxy, B70-200 Series; 3.0 mils DFT.
      - 2) B-M:PPG Water Based 191 Epoxy; 2.0 mils DFT.
      - 3) S-W:Ply-Tile 530 Water Reducible Acrylic Epoxy Semi-Gloss, 051 Line; 2.0 mils DFT.
- F. Interior Woodwork: Including wood doors and trim.
1. Semigloss, Acrylic-Enamel, Low-VOC Finish:
    - a. Primer: 0.8 mil DFT.
      - 1) Harmony Low Odor Interior Latex Primer.
      - 2) Duron: Terminator 2 Water Based Primer/Sealer.
      - 3) Moore: Pristine Eco Spec Interior Latex Primer Sealer 231.
      - 4) Enviro-Pure Primer.
    - b. First and Second Coats: 2.8 mils DFT.
      - 1) S-W: Harmony Low Odor Interior Latex Semigloss.
      - 2) B-M: Pristine Eco Spec Interior Latex Demi Gloss.
      - 3) PPG:
  2. Semi-gloss, Low-VOC Wood Stain and Finish:
    - a. Basis of Design: Sherwin Williams Minwax Fast-Drying Polyurethane Finish system.
      - 1) Pre-Stain Wood Conditioner: Oil Based.
        - a) Stain Color: Minwax Wood Finish Golden Oak 210B.

- b) Clear finish: Oil-based protective finish.
    - c) Sheen: Semi-gloss
  - b. Approved equivalent by one of the following:
    - 1) B-M:
    - 2) PPG:
- G. Interiorly Exposed Galvanized Metal Roof Deck:
  - 1. Primer (Ferrous and Non-Ferrous Metal): ProIndustrial Pro-cryl Universal Primer
  - 2. 2 coats: Low VOC Waterborne Acrylic Dryfall, Flat B42-W00081 / Eg-shell B42-W00082
- H. Interior Ferrous Metal:
  - 1. Semigloss, Acrylic-Enamel, Low-VOC Finish:
    - a. Primer: 0.8 mil DFT.
      - 1) S-W: Procryl Universal Water Based Primer.
      - 2) B-M: IronClad Latex Low Lustre Metal and Wood Enamel 363.
      - 3) PPG: Rich Lux Latex Sealer Undercoater.
    - b. First and Second Coats: 2.8 mils DFT.
      - 1) S-W: Harmony Low Odor Interior Latex Semigloss.
      - 2) B-M: Pristine Eco Spec Interior Latex Semi-Gloss Enamel 224.
      - 3) PPG:

END OF SECTION 09 9000

SECTION 100610  
EXTERIOR SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes exterior site signage, including Building Identification, Park Identification, Pool Rules and Regulations, and Field Rules and Regulations.

1.3 REFERENCES

- A. Philadelphia Parks and Recreation (PPR) Signage Standard Manual.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Kingsessing Recreation Center, 4901 Kingsessing Avenue, Philadelphia, PA 19143.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of sign.
  - 1. Include plans, elevations, sections, and large-scale details of sign construction, wording, and lettering layout. Show anchorages and accessory items. Provide graphic layouts of each individual sign face and message for each sign location. Show fabrication and installation details, including all sign components such as: extrusions, brackets, bracing, hardware, internal framing, etc. Alphabet of each type style required by the contract documents; upper and lowercase, with numerals, punctuation and accents. Shop drawings MUST include all field verified conditions and dimensions. Show installation and mounting heights.
- C. Samples: Samples shall be clearly labeled on the back (where possible), designating item number, name of manufacturer, sign type and location. Fabricator shall submit a minimum of two (2) samples of each color and finish applied on each material type as indicated in the drawing package. Samples should represent the final finish of each

element and will be used as control samples for production approval. Samples should represent extreme variations in color and texture that might occur during fabrication. Please submit the following samples as specified in the drawing package:

1. Color Samples for each specified color, process and finish per PPR Signage Standard Manual. Color submittals shall be submitted on each relevant substrate.
2. Material Samples of each specified Material in each color and finish specified per PPR Signage Standard Manual. Submit manufacturer's standard color palette for color and finish selection.
3. Custom High Pressure Laminate (CHPL) manufacturer must supply project-specific electronic PDF proof for content approval and minimum 8" x 10" x .060" actual material lab samples for color and finish approval from production-ready digital art work and specifications as provided by PPR Signage Standards Manual.
4. Paper Templates: Templates should be fully assembled or have complete registration marks for assembly. Fabricator shall provide to PPR and Landscape Architect full-size paper templates for review and approval in the field of the following sign types:
  - a. PID.1
  - b. PID.4
  - c. PWF.1
  - d. PLY.1
  - e. RUL.1
  - f. RUL.6
5. PPR and Landscape Architect reserves the right to reject any submittal that does not satisfy the requirements. Fabricator shall submit additional drawings/samples as required to obtain final approval.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Fabricator and Installer.
- B. Material Certificates: For the following items:
  1. Shop finishes.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For playground and fitness equipment and finishes to include in maintenance manuals.

#### 1.8 QUALITY ASSURANCE

- A. The Fabricator is required to submit as part of the submittal process additional qualifications for any subcontractors, including but not limited to, installers, electrician, specialty sub-contractor and/or project managers not included or accepted with the bid award of the project. PPR reserves the right to accept or reject any sub-contractor and/or



project manager submitted for review. Qualifications should include: a minimum of 5-10 years relevant experience and shall provide information that illustrates the following:

1. Fabricator and Installer Qualifications: A firm with a minimum of 5 years relevant experience. Fabricator must be approved by PPR. See Part 2 for approved vendors. At a minimum, submit the following:
  2. Firm/Personnel qualifications
  3. Projects of similar size and complexity
  4. Demonstration of high-quality craftsmanship
  5. Project management team and experience.
- B. Work done and materials furnished shall meet the highest industry standards in every respect and, unless otherwise specified, materials and equipment shall be new and of the latest design.
- C. The Design Intent Package should provide everything necessary for a complete contract.
- D. In the event of conflict or omission, the Fabricator shall consult the Designer for resolution. All clarifications are to be made in writing in the form of an RFI from the Fabricator to the Designer.
- E. Use only personnel thoroughly skilled and experienced with the products and method for fabrication and installation of signage specified.
- F. The Owner shall reserve the right to reject any shop drawings, samples or other submittals, as well as any finished product or installation, that cannot meet the standard of quality established. Any such decision will be considered final and not subject to recourse.
- G. Materials and hardware not specified, but necessary to the complete functioning of the sign, shall conform to the quality level established.
- H. Substitutions of items specifically indicated in this specifications package that serve the same function with equal performance will be considered upon submission of substitution.

#### 1.9 WARRANTY

- A. Warrant all products (including, but not limited to: materials, hardware and finishes) against any and all defects based on manufacturers' supplied warranties from date of installation. All manufacturer warranties should be submitted to the Landscape Architect and PPR for review.
  1. Vinyl die-cut letters: warranted against delimitation from substrate.
  2. Paint finishes: warranted against fading or chalking, corrosion developing beneath paint surfaces of the support systems (except for obvious vandalism or other external damage to the paint surfaces).
  3. Corrosion of the fastenings.
  4. The signs not remaining true and plumb on their supports during normal wear.

5. Fading of the colors when matched against a sample of the original color and material.
  6. Discoloration of metal finishes.
  7. Adhesives, e.g. tape and epoxy
  8. Paneling not remaining true and plumb on their supports during normal wear.
  9. CHPL
    - a. Manufacturer warrants that under normal wear and use the workmanship and materials used in the CHPL product purchased from the Manufacturer will meet the standards set forth on the applicable specification materials and that the product will not delaminate, peel, blister, crack or fade for a period ten (10) full years from the date of purchase.
    - b. In the event that the product does not perform as warranted:
      - 1) Manufacturer shall be allowed to conduct an on-site inspection and investigation, or be provided digital images of defects
      - 2) Manufacturer shall work directly with the end-user to resolve any warranty matter,
      - 3) The sole remedy will be the repair or replacement of the defective product at the sole discretion of the Manufacturer, and/ or
      - 4) The repair or replacement by Manufacturer shall be limited to the re-manufacture and shipment of the replacement or repaired product to the site of the end-user's product.
    - c. This warranty only applies to the manufacture and material used in the manufacture of the CHPL product. Manufacturer shall not be liable for any other costs, including but not limited to installation, labor or other costs or expenses. Any repair or replacement shall be warranted for a period up to the remaining life of the original warranty. Further the repair or replacement costs incurred by Manufacturer shall not exceed the purchase price paid for the product.
- B. The Fabricator shall correct any and all material and/ or workmanship defects which may appear during the warranty period by restoring defective work to the standard of the contract documents at no cost to the Owner and to the Owner's satisfaction. Corrections include, but are not limited to: disfiguring of any surface due to chalking, rusting, bubbling, or other disintegration of the sign face or of the messages or of the edge finish of the sign inserts or panel.
- C. Manufacturer warrants that under normal wear and use the installation and sign posts will not crack or fail for a period of one (10) years from the date of substantial completion.
- D. Installer shall provide labor and material warranty for a period of (1) full year from the date of substantial completion.

## PART 2 - PRODUCTS

### 2.1 FABRICATORS

- A. Source Limitations: Subject to compliance with requirements, approved Fabricator's include:

1. Urban Sign and Crane  
527 E. Chestnut Avenue  
Voorhees, NJ 08360  
856.691.8388  
[www.urbansigncompany.com](http://www.urbansigncompany.com)
2. M.S. Signs, Inc.  
6 Morris Street  
Paterson, NJ 07501  
973.569.1111  
[www.mssign.com](http://www.mssign.com)
3. L&H Sign Company  
425 North 3<sup>rd</sup> Street  
Reading, PA 19601  
[www.lhsigns.com](http://www.lhsigns.com)
4. Compass Sign Co LLC  
1505 Ford Road  
Bensalem, PA 19020  
215.639.677  
[www.compass-sign.net](http://www.compass-sign.net)
5. Allied Environmental Signage  
69 Megill Road  
Farmingdale, NJ 07727  
732.751.1818  
[www.allied-signs.com](http://www.allied-signs.com)

### 2.2 EXTERIOR SITE SIGNAGE

- A. PID: PID.4 Park Identification Sign, per PPR Signage Manual.
1. Size: 55 1/8" L x 24" W.
  2. Text, Finishes, and Colors per PPR Signage Manual Requirements.
  3. Quantity: Four (4) Signs
  4. Installation: TBD
- B. PID: PID.1 Pool Identification and Rules Sign, per PPR Signage Manual.
1. Size: 43 1/8"L x 42" W.

2. Text, Finishes, and Colors per PPR Signage Manual Requirements.
  3. Quantity: One (1) Sign
  4. Installation: TBD
- C. PLY: PLY.1 Playground Identification and Rules Sign, per PPR Signage Manual.
1. Size: 45 1/8"L x 24" W.
  2. Text, Finishes, and Colors per PPR Signage Manual Requirements.
  3. Quantity: Three (3) Signs
  4. Installation: TBD
- D. RUL: RUL.1A Sports Field and/or Court Identification and Rules Sign, per PPR Signage Manual.
1. Size: 31"L x 18" W.
  2. Text, Finishes, and Colors per PPR Signage Manual Requirements.
  3. Quantity: Five (5) Signs
  4. Installation: TBD
- E. RUL: RUL.4 Pool Identification and Rules Sign, per PPR Signage Manual.
1. Size: 51"L x 24" W.
  2. Text, Finishes, and Colors per PPR Signage Manual Requirements.
  3. Quantity: One (1) Signs
  4. Installation: TBD
- F. RUL: RUL.6 Single Message Rule Sign, per PPR Signage Manual.
1. Size: 12"L x 8" W.
  2. Text, Finishes, and Colors per PPR Signage Manual Requirements for "NO ANIMALS".
  3. Quantity: Eight (8) Signs
  4. Installation: TBD
- G. PWF: PWF.1 Park Wayfinding Sign, per PPR Signage Manual.
1. Size: 45 1/8"L x 24" W.
  2. Text, Finishes, and Colors per PPR Signage Manual Requirements.
  3. Quantity: One (1) Sign
  4. Installation: TBD

## 2.3 MATERIALS

### A. ALUMINUM

1. Aluminum shall be of best commercial quality and the various forms shall be straight and true. There shall be no scratches, scars or buckles. Size thickness and finish of aluminum shall be per NAAMM "Metal Finishes Manual". Comply with the following industry standards.
2. Aluminum sheets shall conform to ASTM B209 6061-T6
3. Aluminum extrusions shall conform to ASTM B241 6063 T6. Wall thickness shall be a minimum of 1/8" thick unless otherwise shown.

4. Brushed Finishes-Brush with abrasive of increasing grit# in a linear directional pattern.
5. Final surface shall have visible grain pattern to match sample approved by Designer. Spray with clear protective finish.
6. Polished Finish-Brush with abrasive of increasing grit #. Buff to a mirror finish with no visible grain. Match sample approved by Designer. Spray with clear protective finish.
7. Non-Directional Finish-Brush with abrasive mounted in a random orbital sander. Match sample approved by Designer. Spray with clear protective finish.

B. STAINLESS STEEL

1. Structural Stainless steel shapes to be rolled or laser fused, as manufactured by Stainless Structurals, LLC. (936-538- 7600, [www.stainless-structurals.com](http://www.stainless-structurals.com))
2. Chromium stainless steel sheet. Use type 304 or type 316 stainless steel with 16% chromium and 10% nickel.
3. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness. Stainless Steel Plate, Sheet and Strip: Provide stainless steel plate, sheet, or strip, AISI Type 302, complying with requirements of ASTM A 167.
4. Stainless Steel Finishes: Finish designations prefixed by "AISI" conform to the system established by the American Iron and Steel Institute for designating finishes.
5. Finish: Bead blasted & Pickled.

C. CUSTOM HIGH PRESSURE LAMINATE

1. Provide Custom High pressure laminate as manufacturer by iZone or an approved equal.
2. Custom High Pressure Laminate material composed of required layers of phenolic resin impregnated brown kraft filler paper to produce specified thicknesses, surfaced by a layers of melamine overlay, graphics imaged on saturation grade paper with UV resistant pigment based process color inks, and with an optically clear UV overlay that will resist no less that 99% of all sunlight and UV rays, as well as provide a graffiti resistant surface that allows for removal with standard cleaners.
3. Layers of material are to be assembled, and heat/ pressure consolidated at approximately 1200 PSI at temperatures exceeding 275° Fahrenheit at manufacturer's prescribed time frames.
4. All manufacturing processes of printing, pressing, machining, finishing and crating to be accomplished within a single standalone manufacturing facility to ensure consistent quality control and providing standard product delivery times of three weeks.

D. WOOD

1. #1 grade black locust lumber. Sustainably harvested. Eased edges. Apply a UV clear coat to enhance the wood grain and provide additional protection.

E. REFLECTIVE GRAPHICS

1. Provide 3M Scotchlite enclosed lens reflective sheeting or approved equal.

F. VHB FOAM TAPES

1. Provide 3M Scotch VHB 4930
2. Adhesive shall be Acrylic VHB
3. Carrier shall be closed cell foam

G. ACCESSORIES ANCHORS AND FASTENINGS

1. Provide anchors and fasteners required to secure work in place. Do not expose fastenings on surface of sign panels unless specifically noted otherwise. Do not deform, distort or discolor sign face surfaces by attachment of concealed fastenings.
2. All fastenings shall be non-corrosive and resistant to oxidation or other corrosive action, of the same composition completely through their cross sections, particularly when used below grade. Use highest quality stainless steel hardware and fasteners.
3. Anchors, inserts or fasteners shall be compatible with sign materials, shall not result in galvanic action or chemical interaction of adhesives and shall have demonstrable and sufficient strength for intended use.
4. Steel anchors and fastenings for exterior use shall be galvanized in accordance with ASTM A153.
5. Fabricate and install signs with fastenings to withstand all actions imposed by use; 30 psf wind perpendicular to surfaces, water, ice, snow loads and similar forces.
6. Anchor bolts in concrete shall be cast in place. Fabricator shall furnish instructions for the setting of anchors and bearing plates. Fabricator shall ascertain that the items are properly set during the process of the work.
7. Secure work with fastenings of same color and finish as the components they secure where they are exposed to view, unless noted otherwise. All exposed fasteners must be vandal resistant and have vandal-proof "spanner" type slots to be removed only with a special driver head.

H. SELF HEALING TACK SURFACE

1. Provide tack surface as manufactured by Rubber Flooring Inc., or approved equal.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install sign units and components with concealed fasteners unless otherwise shown. Refer to Drawings and PPR Signage Manual for general method of installation. Verify each surface in field to determine appropriate mounting hardware. Fabricator is

responsible for determining where below ground or in-wall structural tie-ins may be required. All elements should be installed true and plumb in accordance with the design intent of this document. Sign location drawings show approximate locations of signs. Fabricator, Landscape Architect, and PPR shall conduct a pre-install mark out walk through to confirm all locations and identify areas of conflict. Fabricator is responsible for determining the location of underground structures and utilities on ground-mounted signs. Any conflicts should be brought to the attention of the PPR and Landscape Architect.

### 3.3 REGULATORY REQUIREMENTS

- A. All installation work shall comply with applicable municipal, state and federal codes, sign ordinances and ADA guidelines for handicapped and fire/life safety signing.
- B. All OSHA safety requirements will be implemented during fabrication and installation as needed or required to comply with safety regulations.
- C. All field/site work shall be conducted in compliance with the Owner/Construction Manager's requirements/ regulations for the site, particularly areas open and accessible to the public. Work area protection shall be required as needed and all site-specific rules should be reviewed and outlined during the project kick-off meeting.

### 3.4 CLEAN UP

- A. Daily and upon completion of installation remove all waste, dirt, wrappings and excess materials, tools and equipment, and thoroughly clean all surfaces to the satisfaction of PPR.

### 3.5 REORDERING

- A. Reordering all items specified in this package shall be available to the Owner in additional quantities for a period of 10 years after completion of all work called for in this specification.

END OF SECTION 100610

## SECTION 10 1400 SIGNAGE

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Room and door signs.
- B. Interior directional and informational signs.
- C. Emergency evacuation maps.
- D. Building identification signs.
- E. Elevator Code Require Signage
- F. Stair Egress Code Require Signage
- G. Restroom Code Require Signage

#### 1.02 GENERAL REQUIREMENTS

- A. The drawings and general provisions of the Contract including the General Conditions apply to work under this Section.
- B. The work in this Section shall be completely coordinated with the work of other Sections. Verify and work of other trades that adjoin materials of this Section before the installation of items herein dimensions specified. Cooperate with such trades to assure the steady progress of all work under this Contract.
- C. All Signs listed in the Scope of Work shall be fabricated and installed.

#### 1.03 RELATED REQUIREMENTS

- A. Section 22 0553 - Identification for Plumbing Piping and Equipment.
- B. Section 26 0553 - Identification for Electrical Systems.
- C. Section 26 5100 - Interior Lighting: Exit signs required by code.

#### 1.04 SCOPE OF WORK

- A. The Contractor shall furnish all materials, labor, tools, equipment and incidentals to fabricate and install all Signing as described herein.
- B. Union members are required for any on-site labor and/or installation.
- C. The scope of work is also to include the removal of all existing signs, and to fill and repair any damaged surfaces.
- D. The Contractor shall fabricate and install signs as indicated in the drawings and schedules attached and as specified herein, shown on drawings and including:
  - 1. Acrylic Signs as shown on drawings:

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS - PACKAGE #2

10 1400 - 1  
SIGNAGE



2. Illuminated Suspended Directional
3. Wall Mounted Directional
4. Elevator
5. Projecting Identification
6. Room Number Identification
7. Stair Level Identification Sign
8. Stair Information Sign
9. Maximum Occupancy Sign

E. The above Scope of Work is documented as follows:

1. Technical Specifications
2. Graphic Standards
3. Detail Drawings
4. Sign Message Schedules
5. Sign Location Plans

#### 1.05 REFERENCE STANDARDS

- A. 36 CFR 1191 - Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines current edition.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
- C. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- D. UL 1994 - Luminous Egress Path Marking Systems Current Edition, Including All Revisions.

#### 1.06 ADDITIONAL STANDARDS

- A. AA: Aluminum Association, 818 Connecticut Avenue, NW, Washington, D.C. 20006.
- B. ADAAG: Americans with Disabilities Act Accessibility Guidelines
- C. ANSI: American National Standards Institute
- D. ASTM: American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103 as published in "Compilation of ASTM Standards in Building Codes"
- E. NEC: National Electric Code - Latest Edition
- F. UL: Underwriters Laboratories Inc. Publication Stock, 333 Pfingsten Road, Northbrook, IL 60062.

#### 1.07 SUBMITTALS

- A. See Section 01 3300 - SUBMITTALS, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.

1. When room numbers to appear on signs differ from those on drawings, include the drawing room number on schedule.
  2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
  3. Submit for approval by Owner through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.
- E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- F. Verification Samples: Submit samples showing colors specified.
- G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.
- H. Manufacturer's Qualification Statement.

#### 1.08 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
- B. The approved manufacturer shall have at least five years of experience in the type of work required; shall have a reputation for doing satisfactory work on time; and shall have recently successfully completed similar work.
- C. The Drawings in this Bid Package are for design intent only. The Contractor is responsible for the proper engineering of all items. The internal structure, dimensions and specifications for all items shall be indicated in the Contractor's shop drawings. Sign Contractor to engineer signs to proper level to withstand abuses of their environment.
- D. The Contractor shall inform the Architect and Owner of any product and/or material deficiencies or incompatibilities that will prevent the signs from withstanding the conditions and abuses of their environment.

#### 1.09 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.
- D. Deliver and store work under this Section in a manner to prevent cracking or stress of components and to prevent mechanical damage or damage by the elements.
- E. Deliver work under this Section to Site in ample time to avoid delay in job progress and at such times as to permit proper coordination of the various parts.

#### 1.10 GUARANTEES

- A. Attention is directed to provisions of the GENERAL CONDITIONS regarding guarantees and warranties for work under this Contract.

- B. Manufacturers shall provide their standard guarantees for work under this Section. However, such guarantees shall be in addition to and not in lieu of all other liabilities which manufacturers and Contractors may have by law or by other provisions of the Contract Documents.
- C. Contractor shall guarantee all work under this Contract for a period of not less than one year during which time the Contractor shall maintain and service all signs provided under this Contract.

#### 1.11 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

### PART 2 PRODUCTS

#### 2.01 MATERIALS

- A. Acrylic
  1. Acrylic shall be cast acrylic sheet that is optically clear, has high impact resistance, weather resistance, formability and machineability.
  2. Acrylic plastic shall be Plexiglas G with smooth finish, Rohm and Haas, Philadelphia, PA, or approved equal.
  3. Clear Non-glare acrylic shall be Clear N2001 Non-glare cell cast acrylic, Calsak Corp. or equal.
  4. Scratch resistant acrylic shall be SRA Acrylic with smooth finish as manufactured by Rohm and Haas Co., Philadelphia, PA, or approved equal.
  5. Saw-cut acrylic letters shall be cut from acrylic sheet, thickness as indicated on Drawings. Letters shall be saw-cut with sharp corners, flat faces and accurate profiles. Polish sides to a smooth finish.
  6. Cast acrylic letters shall have sharp corners and accurate profiles. Remove burrs and rough spots, belt polish to smooth finish.
- B. Stainless Steel
  1. Stainless steel for all Signing shall be Type 304-18-8 alloy, bright cold-rolled stainless steel with no markings.
  2. Cut stainless steel letterforms shall be water jet cut with sharp corners, flat faces, and accurate profiles. Sand sides to smooth finish.
  3. Fabricated stainless steel letterforms shall be of solid stainless steel sheeting. Letterforms shall be rigid, self-supporting and structurally sound. Use brackets and supports as appropriate. All exposed welds shall be filed smooth with all tool marks removed by fine abrasive grain air blasting or other approved method.
  4. Stainless steel shall receive finish as indicated on drawings. Finish shall be uniform without waves or imperfections of any kind. Finishes shall be as follows:
    - a. Satin Finish - #6 brushed finish
- C. Aluminum
  1. Aluminum plate for all signs shall conform to ASTM-B209, Alloy 6061-T6 to thickness indicated on drawings.
  2. Aluminum extrusions for all signs shall conform to ASTM-B221 Alloy 6061-T6 to dimensions and thickness indicated on drawings.

3. Aluminum shall be of best commercial quality and their various forms shall be straight and true. There shall be no scratches, scars, creases or buckles.
4. Stencil cut aluminum shall be cut from sheet aluminum. Letters shall be cut true to form, with no irregularities. Remove all burrs and rough spots. Finish all edges same as sign face.
5. Fabricated aluminum letterforms shall be of solid aluminum sheeting. Letterforms shall be rigid, self-supporting and structurally sound. Use brackets and supports as required. All exposed welds shall be filed smooth with all tool marks removed by fine abrasive grain air blasting or other approved method.
6. Where aluminum is shop fabricated, all joints, returns and the like shall be properly joined together and welded edges shall be ground smooth to proper aluminum finish.
7. Aluminum in contact with dissimilar metals shall have bituminous or other protective coating to prevent electrolytic action.
8. Anodic Finish: All exposed aluminum members shall be free from scratches and other blemishes. Aluminum shall be caustic etched followed by anodized coating equal to Aluminum Association M21 C22 A31 as approved by Architect. Clear anodic finish to match Architect's sample.
9. Aluminum shall receive finish as indicated on drawings. Finish shall be uniform without waves or imperfections of any kind. Finishes shall be as follows:
  - a. Satin Finish - 150 grit

D. Polycarbonate

1. Polycarbonate sheet shall be formed polycarbonate clear or with integral color.
2. Polycarbonate over laminate shall be .015 Lexan Film 8A35-112 with velvet finish first surface, polished finish second surface, GE Plastics.

E. Welding

1. Welding materials and practices shall conform to the requirements of the latest edition of American Welding Society code for steel and aluminum. Shop welders shall be certified by AWS. Welding rods shall be of a composition compatible to the base metal being welded. Welding rods for structural steel shall be an E70 category. Welding of aluminum shall be the MIG process, using ER-5356 wire.
2. Fabrication shall be accomplished using the highest standards of workmanship. All pieces shall be saw cut and carefully fit together. All visible connections shall be full welded and ground flush and smooth. All visible surfaces and connections shall be without visible grounding marks, surface differentiation or variation.

F. Hardware

1. Anchor bolts shall conform to ASTM-A576 with a minimum yield strength of 50,000 PSI. Hexagonal nuts and washers shall be furnished with each bolt.
2. High strength bolts (other than anchor bolts), nuts and washers shall conform to ASTM-A325.
3. All hardware shall be galvanized per ASTM-A153 requirements.
4. Where mechanical fasteners and hardware are required, they shall be of adequate thickness, length and construction to properly secure the sign unit. Any visible portion of any mounting device shall be finished to match adjacent sign surface, unless otherwise specified.
5. Metal fasteners and hardware in contact with dissimilar metals shall have a protective coating or neoprene shields to prevent electrolytic action.
6. Lock cylinders shall be interchangeable core pin tumblers with nickel silver keys; all locks to be keyed alike. Locks to be flush with adjacent cabinetry as indicated in the Drawings. Painted finish to match color and finish of adjacent cabinetry. Provide five sets of keys.
7. Mobile Cable Systems fasteners are by Mobile Cable Systems, Chicago, IL.
8. Tri Pyramid Fasteners are by Tri Pyramid Structures, Inc., Westford, MA

G. Tactile and Braille Plaques

1. Opaque Photo-Polymer - Indoor/Dry Conditions
  - a. Tactile signs shall consist of a 1/32" synthetic (nylo-plastic) light sensitive photo emulsion permanently bonded to a phenolic, aluminum or steel substrate.
  - b. The photo-emulsion shall be removed with a water etching process.
  - c. The background field shall be sprayed with an automotive grade acrylic lacquer with an eggshell finish. The faces of the raised graphics shall be silk-screened with an eggshell finish vinyl ink (LOV). Apply clear coat over all for extra protection.
  - d. This product shall not be used in Exterior or damp conditions.

H. Adhesives

1. Where adhesive mounting techniques are specified, the Contractor shall use adhesives specifically designed for compatibility with the base materials and the desired adhesive strength. All adhesives shall be tested on site. All adhesives shall be indicated in the shop drawings.
2. Surfaces on which Signing is to be installed using adhesive shall be free of grease, oil, or any other residue.
3. Foam tape shall be 1/32" thick, high density open cell double coated polyurethane foam tape, Scotch Mount #4016 by 3M Co., St. Paul, MN, or approved equal.
4. VHB tape shall be double coated acrylic foam tape #4920 by 3M Co., St. Paul, MN, or approved equal.
5. Provide necessary amounts of clear silicone sealant or grout for use in pin mounting.

I. Electrical

1. All electrical items - light fixtures, LED lamps, wiring and appurtenances necessary for the signs shown in the drawings shall be provided and installed as part of this Contract. All specific electrical equipment required by product codes or building codes, such as item grounds, disconnect switches, insulation etc. shall be shown and noted in the shop drawings.
2. The Contractor shall insure that the graphic area of each illuminated sign is illuminated evenly, with no hot spots, light leaks or drop-off of light intensity at the borders of the graphic area.
3. The Contractor shall insure that there are no light leaks on the sign face or around the perimeter of the sign frame.
4. All electrical items shall bear an Underwriter's label.

J. Masking and Spraying

1. All masking shall be executed with pre-spaced vinyl legends prepared from typesetter's reproductions of the copy specified. Typesetter's reproductions shall be no smaller than 50% of the actual size specified. Graphic mask shall be assembled on sign panel or wall in a professional manner prior to spraying. No hand-cut masks shall be used.
2. Masking and spraying shall be done carefully so as not to leave bleeding or rough edges at painted surfaces. All edges and corners of the finished graphics shall be true and clean. Graphics with rounded positive or negative corners will not be accepted.
3. Spray guns used for artwork shall be airless type as approved. All graphic work shall receive at least two coats of paint.

K. Typeface

1. All copy shall be in the typeface Gill Sans Book and Gill Sans Regular to match the letterforms shown in the Detail Drawings.
2. The Contractor is responsible for purchasing all fonts and typesetting all messages and providing final sign layouts for review and approval.

3. All types of graphics - engraved, photo-polymer, saw-cut, vinyl, silk screened, etc. shall be produced using specified using a PC or Mac link to the final graphic output device.

L. Braille

1. All Braille on tactile signs shall be Grade 2 domed Braille and shall conform to the standard dimensions for literary Braille - as outlined in the Americans With Disabilities Act (ADA).

M. Typesetting

1. All typeset messages shall be prepared on a Macintosh or IBM PC. Letterforms shall match the samples shown in the drawings.
2. Standard letter spacing and standard word spacing shall be approved by Designer for all fonts before final manufacture.
3. Typical type and symbol layout for each sign type is indicated on the Design Drawings. All type shall be placed according to the dimensions shown on the drawings. Should any design conflict occur in the fabrication of the signs; i.e., type not fitting, it shall be brought to the attention of the Designer.

## 2.02 MANUFACTURERS

A. Flat Signs:

1. ASI Sign Systems, Inc.: [www.asisignage.com/](http://www.asisignage.com/)
2. Best Sign Systems, Inc: [www.bestsigns.com/#sle](http://www.bestsigns.com/#sle).
3. Cosco Industries (ADA signs); ADA Series 1: [www.coscoarchitecturalsigns.com/#sle](http://www.coscoarchitecturalsigns.com/#sle).
4. Cosco Industries (non-ADA signs); Changeable Message Signs: [www.coscoarchitecturalsigns.com/#sle](http://www.coscoarchitecturalsigns.com/#sle).
5. FASTSIGNS: [www.fastsigns.com/#sle](http://www.fastsigns.com/#sle).
6. Inpro: [www.inprocorp.com/#sle](http://www.inprocorp.com/#sle).
7. Mohawk Sign Systems, Inc: [www.mohawksign.com/#sle](http://www.mohawksign.com/#sle).
8. Seton Identification Products: [www.seton.com/aec/#sle](http://www.seton.com/aec/#sle).

B. Other Signs - as indicated on drawings:

## 2.03 SIGNAGE APPLICATIONS

A. Accessibility Compliance: Signs are required to comply with ADA Standards and ICC A117.1, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

B. Room and Door Signs: Provide a sign for every doorway, as shown on Signage Drawings.

1. Sign Type: Flat signs with engraved panel media as specified.
2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
3. Character Height: as indicated on Drawings
4. Sign Height: as indicated on Drawings..
5. Office Doors: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section for replaceable occupant name.
6. Conference and Meeting Rooms: Identify with room numbers to be determined later, not the numbers indicated on drawings; in addition, provide "window" section with sliding "In Use/Vacant" indicator.
7. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.

8. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.

C. Interior Directional and Informational Signs:

D. Emergency Evacuation Maps:

1. Allow for one map per elevator lobby.
2. Map content to be provided by Owner.
3. Use clear plastic panel silk-screened on reverse, in brushed aluminum frame, screw-mounted.

## 2.04 SIGN TYPES

A. Flat Signs: Signage media without frame.

1. Edges: Beveled.
2. Corners: Square.
3. Clear Cover: For customer produced sign media, provide clear cover of polycarbonate plastic, glossy on back, non-glare on front.
4. Wall Mounting of One-Sided Signs: Mechanically fastened.

B. Color and Font: Unless otherwise indicated:

1. Character Font: As indicated on Drawings.
2. Character Case: Upper case only.
3. Background Color: Clear or as indicated on Drawings.
4. Character Color: Contrasting color.

## 2.05 TACTILE SIGNAGE MEDIA

A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:

1. Total Thickness: 1/16 inch.

## 2.06 FINISHES

A. Paints

1. Paints for metal signs shall be finished with acrylic polyurethane semi-gloss enamel as manufactured by Matthews Paint Co., Wheeling, Ill., or approved equal.
2. Paints for plastic signs shall be eggshell finish Gripflex enamel by Wyandotte Co., Norcross, GA or approved equal.
3. Paints for backgrounds of photo-polymer signs shall be eggshell finish automotive grade lacquer.
4. All surfaces shall be cleaned, primed and pre-treated according to manufacturer's specifications and noted in Shop Drawings as part of the finished surface work.

B. Paints on Wall

1. All paint used for the project shall match the following manufacturer or as approved by the Designer:
2. The following schedule is not intended to restrict competitive bidding. The materials hereinafter mentioned are solely to designate and identify the quality of material to be used on the project:
3. All painting shall be carefully done and left perfect. No paint spots shall be left on glass, hardware or other finished work. Properly prepare all surfaces before painting by cutting,

stopping, filling, etc., to ensure a smooth uniform surface without blemishes or variations of gloss.

4. All material shall be applied by skilled mechanics and paint shall be evenly flowed on, spread and thoroughly brushed out. Finished surfaces shall be uniform in gloss, finish and shall be free from brush marks, sags and runs.
5. All lines of demarcation between paints of different colors or shades shall be carefully drawn so as to be true and free from blurred edges.
6. All painting shall be done by a Contractor accustomed to doing only work of the highest quality.

C. Inks

1. Inks for metal signs, glass and wall surfaces shall be 5,900 series Alkyd enamel, Nazdar Co., Chicago, IL, or approved equal.
2. Inks for plastic signs shall be Plasti-Vac 70,000 series lacquer, Nazdar Co., Chicago, IL, or approved equal.
3. Inks for raised graphics on photo-polymer signs shall be eggshell finish Low Odor Vinyl Ink.
4. Inks for silk-screening on reflective sheeting shall be "Scotchlite" brand screen printing ink series 700 by 3M Co., St. Paul, MN, or approved equal.
5. Inks for filling acid-etched graphics in metal signs shall be semi-gloss epoxy ink.
6. All inks and paints shall be evenly applied without pinholes, scratches or application marks. Prime coats or other surface pre-treatments, where recommended by the manufacturers, shall be included in the work and noted in the shop drawings as part of the finished surface work.

## 2.07 ACCESSORIES

- A. Concealed Screws: Stainless steel, galvanized steel, chrome plated, or other non-corroding metal.
- B. Exposed Screws: Chrome plated, Tamper-proof fasteners.
- C. Tape Adhesive: Double sided tape, permanent adhesive
  1. Tape Adhesive not allowed unless mechanical fasteners are not feasible.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

### 3.02 PREPARATION AND INSPECTION

- A. All surfaces to receive work shall be prepared and finished by the respective trades. The Sign Contractor shall notify the Designer if surfaces or openings are not satisfactory to receive this work. Commencement of work by Sign Contractor shall constitute acceptance of conditions and surfaces. Subsequent work not accepted by the Designer shall be replaced at no additional cost to the Owner.
- B. Prior to installation of all sign types each type shall be verified in field as to meet field conditions. Sign Contractor shall notify Architect if corresponding room name and number signs do not meet field conditions.



- C. All work shall be performed in accordance with a written schedule agreed on by Owner, Contractor, Designer and Sign Installer. In any case where work cannot be completed on schedule, the Contractor shall supply temporary signs at no additional expense to the Owner.
- D. All work shall be subject to inspection and approval by the Designer in the shop or field at any reasonable time. Provide at least 72 hours notice for Designer's inspection of complete fabricated signs before delivery.

### 3.03 WORKMANSHIP, PERFORMANCE

- A. All work shall present clean, straight sharply defined lines, free from defects impairing strength or durability, and shall be performed in a shop where the grade of work is of a quality acceptable to the Designer. All work shall be installed plumb, straight, square, level and in proper elevation plane, location, and alignment with other work. All work shall be designed for adjustment to field variations, fitted with proper joints and intersections, and adequately anchored in place. All workmanship and finishes shall be of best quality in every particular, strictly in accordance with best practice. All work shall be complete in every detail. Finish work shall be subject to approval by the Designer.

### 3.04 INSTALLATION / APPLICATION / ERECTION

- A. Members shall be shop-fabricated, and where practical, all work shall be delivered to the site completely assembled. All joints of such fabricated work shall be completely smooth without apparent marks showing throughout the finish. All work "broken down" shall be erected so that all parts fit accurately with hairline joints.
- B. Unless otherwise shown on the Drawings, all members shall be continuous lengths without seams. Work shall be formed to profiles indicated on the Drawings.
- C. Where material lengths require joints, all joints shall be flush. Similar materials at joints shall be either bonded or welded together, or shall be lap jointed to provide for expansion. All joints to be lightproof.
- D. Protect adjacent or adjoining surfaces and work from damage during installation in this section.
- E. Work shall be designed and anchored so that work will neither be distorted nor the fasteners overstressed from expansion and contraction of metal or other materials as applicable.

### 3.05 CLEANING AND PROTECTION

- A. At completion, all work shall be checked over, re-adjusted, and left in first class condition. Signs shall be cleaned with non-abrasive cleaning agents without damage to sign surfaces.
- B. Manufacturer shall provide Owner with information on cleaning and maintenance recommendations for all signs.
- C. Names, stamps and decals of manufacturers, installers or maintainers of signs shall not be visible in the finish work.

### 3.06 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.

- C. Locate signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.
- D. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

END OF SECTION 10 1400

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SECTION 10 2113.19  
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Solid plastic toilet compartments.
- B. Urinal and vestibule screens.

1.02 RELATED REQUIREMENTS

- A. Section 05 5000 - Metal Fabrications: Concealed steel support members.
- B. Section 06 1000 - Rough Carpentry: Blocking and supports.
- C. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
- C. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
  - 1. Include plans, elevations, sections, details, and attachment details.
  - 2. Show locations of cutouts for compartment-mounted toilet accessories.
  - 3. Show locations of centerlines of toilet fixtures.
  - 4. Show locations of floor drains.
  - 5. Show ceiling-mounted items, and overhead support or bracing locations.
- D. Samples: Submit two samples of partition panels, 6 by 6 inch in size illustrating panel finish, color, and sheen.
- E. Manufacturer's Installation Instructions: Indicate special procedures.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Solid Plastic Toilet Compartments Basis of Design:
  - 1. Scranton Products; Hiny Hiders Partitions: [www.scrantonproducts.com/#sle](http://www.scrantonproducts.com/#sle).
  - 2. Santana Products Co..
  - 3. Basis of Design Panel Selection
    - a. Midnight Orange Peel
  - 4. Subject to compliance with requirements equal products from the following maybe considered with approval:
  - 5. Bobrick Washroom Equipment, Inc.
  - 6. Bradley Corporation

### 2.02 PLASTIC TOILET COMPARTMENTS

- A. Toilet-Enclosure Style: Floor and ceiling anchored.
- B. Entrance-Screen Style: Floor and ceiling anchored.
- C. Urinal-Screen Style: Post to ceiling.
- D. Solid Plastic Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286; floor and ceiling anchored.
  - 1. Solid, high-density polyethylene (HDPE) panel material, not less than 1 inch thick, seamless, with eased edges, no-sightline system, and with homogenous color and pattern throughout thickness of material.
  - 2. Integral Hinges: Configure doors and pilasters to receive integral hinges.
  - 3. Heat-Sink Strip: Manufacturer's standard continuous, stainless-steel strip fastened to exposed bottom edges of solid-plastic components to hinder malicious combustion.
  - 4. Color and Pattern: One color and pattern in each room as selected by Architect from manufacturer's full range.
  - 5. Pilaster Shoes and Sleeves (Caps): Manufacturer's standard design; stainless steel.
  - 6. Urinal-Screen Post: Manufacturer's standard post design of material matching the thickness and construction of pilasters; with shoe and sleeve (cap) matching that on the pilaster.
  - 7. Brackets (Fittings):
    - a. Stirrup Type: Ear or U-brackets, stainless steel
    - b. Full-Height (Continuous) Type: Manufacturer's standard design; stainless steel.
  - 8. Doors:
    - a. Thickness: 1 inch.
    - b. Width: 24 inch.
    - c. Width for Handicapped Use: 36 inch, out-swinging.
    - d. Height: 55 inch.
  - 9. Panels:
    - a. Thickness: 1 inch.
    - b. Height: 55 inch.
  - 10. Pilasters:
    - a. Thickness: 1 inch.
    - b. Width: As required to fit space; minimum 3 inch.

## 2.03 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
  - 1. Flame-Spread Index: 75 or less.
  - 2. Smoke-Developed Index: 450 or less
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1 for toilet compartments designated as accessible.

## 2.04 MATERIALS

- A. Aluminum Castings: ASTM B 26/B 26M.
- B. Aluminum Extrusions: ASTM B 221.
- C. Brass Castings: ASTM B 584.
- D. Brass Extrusions: ASTM B 455.
- E. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness.
- F. Stainless-Steel Castings: ASTM A 743/A 743M.
- G. Zamac: ASTM B 86, commercial zinc-alloy die castings.

## 2.05 HARDWARE AND ACCESSORIES

- A. Hardware and Accessories: Manufacturer's heavy-duty operating hardware and accessories.
- B. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
  - 1. Hinges: Manufacturer's minimum 0.062-inch-thick stainless-steel continuous, cam type that swings to a partially open position, allowing emergency access by lifting door. Mount with through-bolts.
  - 2. Latch and Keeper: Manufacturer's heavy-duty surface-mounted cast-stainless-steel latch unit designed to resist damage due to slamming, with combination rubber-faced door strike and keeper, and with provision for emergency access. Provide units that comply with regulatory requirements for accessibility at compartments designated as accessible. Mount with through-bolts.
  - 3. Coat Hook: Manufacturer's heavy-duty combination cast-stainless-steel hook and rubber-tipped bumper, sized to prevent in-swinging door from hitting compartment-mounted accessories. Mount with through-bolts.
  - 4. Door Bumper: Manufacturer's heavy-duty rubber-tipped cast-stainless-steel bumper at out-swinging doors. Mount with through-bolts.
  - 5. Door Pull: Manufacturer's heavy-duty cast-stainless-steel pull at out-swinging doors that complies with regulatory requirements for accessibility. Provide units on both sides of doors at compartments designated as accessible. Mount with through-bolts.
- C. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless-steel, hot-dip galvanized-steel, or other rust-resistant, protective-coated steel compatible with related materials.

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PLASTIC TOILET COMPARTMENTS

- D. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing floor fastenings.
- E. Attachments, Screws, and Bolts: Stainless steel , tamper proof type.

## 2.06 FABRICATION

- A. Fabrication, General: Fabricate toilet compartment components to sizes indicated. Coordinate requirements and provide cutouts for through-partition toilet accessories where required for attachment of toilet accessories.
- B. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism.
- C. Floor-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for structural connection to floor. Provide shoes at pilasters to conceal anchorage.
- D. D. Ceiling-Hung Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at pilasters for connection to structural support above finished ceiling. Provide assemblies that support pilasters from structure without transmitting load to finished ceiling. Provide sleeves (caps) at tops of pilasters to conceal anchorage.
- E. Floor-and-Ceiling-Anchored Units: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at tops and bottoms of pilasters. Provide shoes and sleeves (caps) at pilasters to conceal anchorage.
- F. F. Urinal-Screen Posts: Provide manufacturer's standard corrosion-resistant anchoring assemblies with leveling adjustment nuts at tops and bottoms of posts. Provide shoes and sleeves (caps) at posts to conceal anchorage.
- G. Door Size and Swings: Unless otherwise indicated, provide 24-inch-wide, in-swinging doors for standard toilet compartments and 36-inch-wide, out-swinging doors with a minimum 32-inch-wide, clear opening for compartments designated as accessible.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.
- D. Examine areas and conditions, with Installer present, for compliance with requirements for fastening, support, alignment, operating clearances, and other conditions affecting performance of the Work.
  - 1. Confirm location and adequacy of blocking and supports required for installation.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, level, and plumb. Secure units in position with manufacturer's recommended anchoring devices.
  - 1. Maximum Clearances:
    - a. Pilasters and Panels: 1/2 inch.
    - b. Panels and Walls: 1 inch.
  - 2. Stirrup Brackets: Secure panels to walls and to pilasters with no fewer than three brackets attached at midpoint and near top and bottom of panel.
    - a. Locate wall brackets so holes for wall anchors occur in masonry or tile joints.
    - b. Align brackets at pilasters with brackets at walls.
  - 3. Full-Height (Continuous) Brackets: Secure panels to walls and to pilasters with full-height brackets.
    - a. Locate bracket fasteners so holes for wall anchors occur in masonry or tile joints.
    - b. Align brackets at pilasters with brackets at walls.
- B. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.
- C. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- D. Attach panel brackets securely to walls using anchor devices.
- E. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- F. Floor-and-Ceiling-Anchored Units: Set pilasters with anchors penetrating not less than 2 inches into structural floor unless otherwise indicated in manufacturer's written instructions. Secure pilasters to supporting construction and level, plumb, and tighten. Hang doors and adjust so doors are level and aligned with panels when doors are in closed position.
- G. Urinal Screens: Attach with anchoring devices to suit supporting structure. Set units level and plumb, rigid, and secured to resist lateral impact.

### 3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.

### 3.04 ADJUSTING

- A. Hardware Adjustment: Adjust and lubricate hardware according to hardware manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to hold doors open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors to return doors to fully closed position.

### 3.05 SCHEDULES

- A. TA2 floor mounted Toilet Partition system with stall doors and hardware including heavy-duty surface-mounted Coat Hook for public restrooms

END OF SECTION 10 2113.19



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## SECTION 10 2213 WIRE MESH PARTITIONS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Wire mesh systems for stairways and with full size door gates.

#### 1.02 RELATED REQUIREMENTS

- A. Section 08 7100 - Door Hardware: Cylinders for locksets.
- B. Section 09 9123 - Interior Painting.

#### 1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.
- D. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel 2020.
- E. ASTM A580/A580M - Standard Specification for Stainless Steel Wire 2018.
- F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- G. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for mesh materials, finishes, and attachments.
- C. Shop Drawings: Indicate plan and vertical dimensions, elevations, component details; head, jamb, and sill details; location of hardware. Provide component details, anchorage, and type and location of fasteners.
  - 1. Show field measurements on shop drawings.
- D. Samples: Submit two \_\_\_\_\_, \_\_\_\_ by \_\_\_\_ inch in size, illustrating mesh material. Submit samples of hinge and latchset illustrating style, color, and finish. Incorporate sample into the work.
- E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and operative door size gate.

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WIRE MESH PARTITIONS

## 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
  - 1. Member firm of the Woven Wire Products Association (WWPA).
- B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

## PART 2 PRODUCTS

### 2.01 MANUFACTURERS

- A. Basis of Design for Wire Mesh Stairwell Enclosures:
  - 1. Newark Wire Works Inc.
    - a. 1059 King Georges Post Rd. Edison, NJ 08837
    - b. (732)-661-2001 main; (732)-661-2003 fax
    - c. Sales@newarkwireworks.com
    - d. www.newarkwireworks.com
- B. Subject to compliance with requirements, Wire Mesh Partition Stairwell Enclosures products by one of the following manufacturers may be submitted under the provisions of Division 01, Substitution Procedures.
  - 1. Acorn Wire and Iron Works, Inc: [www.acornwire.com/#sle](http://www.acornwire.com/#sle).
  - 2. The G-S Company; Sure Guard Standard Duty: [www.g-sco.com/#sle](http://www.g-sco.com/#sle).
  - 3. Miller Wire Works, Inc: [www.millerwireworks.com/#sle](http://www.millerwireworks.com/#sle).
  - 4. Spaceguard Products; BeastWire Mesh Partitions with Standard Welded Wire Mesh- 2 inch square: [www.spaceguardproducts.com/#sle](http://www.spaceguardproducts.com/#sle).

### 2.02 WIRE MESH PARTITIONS

- A. Wire Mesh Partitions: Factory-fabricated modular assemblies of panels, doors, anchors, hardware, and accessories as required to provide a complete system.
  - 1. Design Criteria:
    - a. Design partition system to provide for movement of components without damage, undue stress on fasteners or other detrimental effects, when subject to design loads.
    - b. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
    - c. Comply with applicable code for wire mesh opening size.
  - 2. Performance:
    - a. Installed Wall Assembly: Resist a lateral load of as required by code lbs without damage or permanent set.
    - b. Hinged Door and Panel in Open Position: Resist a downward load of as required by code lbs without damage or permanent set.
    - c. As required by code.

### 2.03 Components

- A. Woven Wire Mesh: Heavy duty.
  - 1. Material: ASTM A510/A510M uncoated crimped steel wire.
  - 2. Wire Size: 6 gauge, 0.192 inch.

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WIRE MESH PARTITIONS

3. Mesh Opening Size: 2 inch max diamond shape.
4. Mesh Weave: Plain weave, double crimped.
5. Mesh 10ga. (.135 ) plain steel, inter-crimped and woven into a 1 1/2" diamond mesh. Mesh is passed through and securely clinched or welded to frame

B. Wall Panels:

1. Vertical frame: 1 1/4" x 5/8" x 13ga. steel "C" channel
2. Horizontal frame: 1" x 1/2" x 11ga. steel channel
3. Mid-rail : 1" x 1/2" x 11ga. steel channel

C. Hinged Doors:

1. Vertical frame: 1 1/4" x 5/8" x 13ga. steel "C" channel
2. Horizontal frame: 1" x 1/2" x 11ga. steel channel
3. Mid-rail : 1" x 1/2" x 11ga. steel channel
4. Capping: 1 1/2" x 3/4" x 11ga. steel channel
5. Lock: Marks 3700 series

D. Larger height partition stiffening posts:

1. 2" x 2" x 14ga. steel tube: 7'-0" - 18'- 0"
2. Higher: Strictly follow Manufacture's requirements.

E. Line Posts:

1. Type: for 8'- 0" high partitions and below long spans (15'- 3"o.c.)

F. Attaching to access flooring or concrete floor:

1. 3"x1 1/2" x 11ga. Steel channel with bolt holes to match panel & welded base plate w/ 4 holes for tek screws into access floor

G. Into concrete floor below access flooring:

1. 3"x3"x11ga. Steel square tube with 8"x8"x1/4" welded base plate with 4 holes with 3/8" diameter wedge anchors into concrete floor

## 2.04 FASTENERS

- A. Bolts, Nuts and Washers: Hot dip galvanized.
- B. Anchorage Devices: Provide power driven, powder actuated, and drilled expansion bolts.

## 2.05 ACCESSORIES

- A. Bracing: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.
- B. Plates, Gussets, Clips: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.
- C. Post Caps: Manufacturer's standard.
- D. Floor and Ceiling Pilaster Shoe: Manufacturer's standard.
- E. Floor Base: Manufacturer's standard.

## 2.06 FABRICATION

- A. Fit and assemble in largest practical sections for delivery to site, ready for installation.

- B. Make exposed joints flush or tight.
- C. Provide mortised and tenoned joints for framing members.
- D. Provide components required for anchorage to adjacent construction.
- E. Frame openings made for penetrating mechanical and electrical components.

#### 2.07 LOCKS

- A. Use updatable cores compliant with PPR Keying system; refer to Door and Hardware Schedule and Specification.

#### 2.08 FINISHES

- A. Painted Finish: Manufacturer's standard powder coat finish.
  - 1. Electro statically shop applied polyester powder coat, oven cured.
  - 2. Color: as selected by architect from Manufacturer's full range.
- B. Where applicable provide: Galvanized Finish: In accordance with requirements of ASTM A123/A123M.

### PART 3 EXECUTION

#### 3.01 EXAMINATION

- A. Verify that field measurements are as indicated.
- B. Verify that substrate surfaces and required openings are ready to receive work.

#### 3.02 PREPARATION

- A. Clean substrate surfaces.
- B. Clean partition surfaces of rust, scale, grease, and foreign matter prior to field finishing as specified in Section 09 9123.

#### 3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install items plumb and level, accurately fitted, free from distortion or defects.
- C. Perform field welding in accordance with AWS D1.1/D1.1M.
- D. After installation, touch-up field welds scratched or damaged surfaces with shop applied finish.

#### 3.04 TOLERANCES

- A. Maximum Variation From Plumb or Level: 1/4 inch.
- B. Maximum Misalignment From True Position: 1/4 inch.

3.05 ADJUSTING

- A. Adjust doors to achieve free movement.

3.06 CLEANING

- A. Remove temporary protection to prefinished surfaces.

END OF SECTION 10 2213

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## SECTION 10 2600 WALL AND DOOR PROTECTION

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Protective wall covering; WP-1.
  - 1. Panel seam direction -vertical UNO - defer to drawings

#### 1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Blocking for wall and corner guard anchors.
- B. Section 09 2116 - Gypsum Board Assemblies: Placement of supports in stud wall construction.
- C. Section 09 2216 - Non-Structural Metal Framing: Placement of supports in stud wall construction.

#### 1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- B. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics 2023, with Editorial Revision.
- C. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents 2021.
- D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
- E. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2022.
- F. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies 2023.
- G. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi 2015, with Editorial Revision (2021).
- H. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

#### 1.04 ADDITIONAL REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. American Society for Testing & Materials (ASTM):
  - 1. AST ASTM E 84-05 Standard Test Method for Surface Burning Characteristics of Building Materials. CLASS A
  - 2. ASTM D5420 Gardner Impact Exceeds 160 inch pounds

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WALL AND DOOR PROTECTION



3. ISO 14644 - 9:12 Standard Laboratory Practice for Quantifying Air Cleanliness by Particle Concentrations
4. A 01350 – Measures VOC emissions produced by product
5. DIN IEC 60 167 – Surface resistance
6. ASTM G21 – Fungi resistance
7. ASTM D3273 – Mold resistance
8. ISO 62 – Water absorption
9. ASTM G154 – UV exposure

#### 1.05 SUBMITTALS

- A. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.
- B. Shop Drawings: Include plans, elevation, sections, and attachment details. Show design and spacing of supports for protective corridor handrails, required to withstand structural loads.
- C. Samples: Submit samples illustrating component design, configurations, joinery, color and finish.
  1. Submit two samples of protective wall covering and door surface protection, 6 by 6 inches square.
- D. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- E. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- F. Maintenance Data: Manufacturer's instructions for care and cleaning of each type of product. Include information about both recommended and potentially detrimental cleaning materials and methods.

#### 1.06 QUALITY ASSURANCE

- A. Installer Qualifications: Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project with a minimum of 3 years experience.
  1. Training: Installer who has attended an Altro Whiterock installation training clinic and has received their certificate of course completion.

#### 1.07 DELIVERY, STORAGE, AND HANDLING

- A. Protect work from moisture damage.
- B. Protect work from UV light damage.
- C. Do not deliver products to project site until areas for storage and installation are fully enclosed, and interior temperature and humidity are in compliance with manufacturer's recommendations for each type of item.
- D. Store products in either horizontal or vertical position, in compliance with manufacturer's instructions.

1.08 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 PERFORMANCE CRITERIA

- A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.
- B. Chemical and Stain Resistance: Unless otherwise noted, provide protection products and assemblies with chemical and stain resistance complying with applicable provisions of ASTM D543.
- C. Fungal Resistance: Unless otherwise noted, provide protection products and assemblies which pass ASTM G21 testing.

2.02 PRODUCT TYPES

- A. Basis of Design Wall Panel
  - 1. Manufacturer: Altro
    - a. USA: 80 Industrial Way, Wilmington, MA 01887 Toll-free: 800.377.5597 Fax: 978.694.0433
    - b. E-mail: support@altrofloors.com Web Site: www.altrofloors.com.
  - 2. HYGIENIC WALL COVERINGS
    - a. Altro Whiterock™ is 100% pure vinyl, extruded, semi-rigid PVCu sheet. Altro Whiterock contains no plasticizers or fillers. Altro Whiterock is homogenous.
    - b. Acceptable material: Altro Whiterock™ (measurements and product weights given below are approximate):
  - 3. Product:
    - a. WP-1: WALL PROTECTION PANEL: ALTRO, WHITEROCK, COLOR: MOCHA / FAWN, 2.5MM THICKNESS
  - 4. ACCESSORIES
    - a. Provide the following as required for complete system:
    - b. Vinyl welding rod: Acceptable material:
      - 1) Altro weld rod – WSR01 White, WSR/\*\* color
    - c. Joint Strips:
      - 1) 1-Part Joint Strip – [G831/25 White] Length 98.5”
      - 2) 1-Part Joint Strip – [G831/30 White] Length 118”
      - 3) 2-Part Joint Strip – [A831/25 White] [A831/25/\*\* color] Length 98.5”
      - 4) 2-Part Joint Strip – [A831/30 White] [A831/30/\*\* color] Length 118”
    - d. Cut-Tile Transition Strips:
      - 1) 1-Part Transition Strip – [G832/25 White] Length 98.5”
      - 2) 2-Part Joint Strip – [A832/25 White] [G831/30/\*\* color] Length 98.5”
      - 3) C4 CAP Strip – [C4 CAP White] Length 72”
    - e. Start and Edge Trim:
      - 1) 1-Part Start and Edge Trim – [G833/25 White] Length 98.5”
      - 2) 1-Part Start and Edge Trim – [G833/30 White] Length 118”
      - 3) 2-Part Start and Edge Trim – [A833/25 White] [A833/25/\*\* color] Length 98.5”

- 4) 2-Part Start and Edge Trim – [A833/30 White] [A833/30/\*\* color] Length 118"
- f. Polyurethane Adhesive: The default adhesive for most installations, suitable for wet area, non-climate controlled areas, and non-absorbent surfaces, use AltroFix W39, a two-part resin-based polyurethane adhesive as recommended by manufacturer.
- g. Caulking and Sanitary Sealant Sealant Compounds and Tools:
  - 1) Altro Sanitary Sealant – [A802 White, A803 Clear, A806/\*\* color) 10.5 oz Tube
- 5. SOURCE QUALITY
- 6.

## 2.03 FABRICATION

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.

## 2.04 SOURCE QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements, for additional requirements.
- B. Provide wall and door protection systems of each type from a single source and manufacturer.

## PART 3 EXECUTION

### 3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog, installation instructions and product label instructions for installation.

### 3.02 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.
- B. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
- C. Verify that field measurements are as indicated on drawings.
- D. Verify that substrate surfaces for adhered items are clean and smooth.
  - 1. Test painted or wall covering surfaces for adhesion in inconspicuous area, as recommended by manufacturer. Follow adhesive manufacturer's recommendations for remedial measures at locations and/or application conditions where adhesion test's results are unsatisfactory.
- E. Start of installation constitutes acceptance of project conditions.

### 3.03 SUBSTRATE PREPARATION

- A. Walls should be smooth and level. High points must be removed and low points filled with filler intended for the substrate and environmental conditions.

- B. Wall tiles must be fixed firmly to the wall. As long as the tile edges do not protrude, you do not have to skim grout joints.
- C. Surfaces must be permanently dry and free from all substances that may contribute to adhesive bond failure.
- D. Remove loose paint and conduct an adhesive bond test with paint.
- E. Exterior walls must be adequately damp-proofed and insulated.
- F. Dry wall substrates should be paint ready.

### 3.04 PREPARATION

- A. All surfaces must be free from dust and cleaned prior to Altro Whiterock installation. The working environment must also be dust free. Failure to comply with these conditions will reduce the bond strength between the adhesive and substrate, and may cause the Altro Whiterock panels to debond.
- B. Very absorbent / porous substrates (particularly plaster finishes and unprimed sheetrock) must have a proprietary sealer e.g. PVA primer or similar, applied to the surface a minimum of 12 hours prior to the installation.
- C. All electrical switches, power points etc., should be in a first fix / installation state. All electrical equipment should only be moved or altered by a qualified electrician.
- D. All plumbing should have pipe-work removed to a first fix or installation state and “tails” left protruding from the substrate. Altro Whiterock panels can then be drilled and slid over the pipe tails. All holes should be drilled 1/8” (3mm) oversize to allow for expansion, then sealed with Altro Sanitary Sealant. Plumbing should always be done by a qualified plumber.
- E. Hot pipes and steam pipes should be insulated and a 1/8” to 1/4” (3-6mm) expansion gap should be created when installing panels around these pipes, then sealed with Altro Sanitary Sealant.
- F. All pipes, fixing bolts, etc. extending through the Altro Whiterock panels should have a minimum 1/8” (3mm) expansion gap and be sealed using Altro Sanitary Sealant.
- G. If fitting to doorframes, these must be in place prior to installation of Altro Whiterock.
- H. Prior to installation, it is advisable to complete any painting which comes in contact with Altro Whiterock, as sealant used at junctions is non-paintable.
- I. First, check the room using a 6’ (2 m) level to ensure all walls are flat, paying particular attention to the corners, window reveals, and door entrances. These need to be inspected to ensure they are free of any debris or irregularities, which could prevent the panels laying flat to the substrate after the adhesive has been applied and the panel installed.

### 3.05 INSTALLATION

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to supporting construction.
- B. Hygienic Wall Installation: Install Altro Whiterock in accordance with the current published Altro Installation Guide. All panels should be joined via heat welding to ensure a hygienic seal by approved methods as detailed in the installation guide. Failure. to install Altro Whiterock in

accordance with recommended procedures will void the Altro Limited Product Warranty.

- C. Internal and external pencil radius corners shall be made on site with Altro Thermoformer following the methods detailed in the Altro Whiterock Installation Guide.
- D. Position protective wall covering no less than 1 inch above finished floor to allow for floor level variation.
  - 1. Wainscot Installation: Establish a level line at the specified height for entire length of run. Install by aligning top of edge of covering with this line. Refer to drawings for height which varies between location with-in building.
  - 2. Apply adhesive with 1/8 inch V-notch trowel to an area of wall surface that can be completed within cure time of the adhesive.

### 3.06 FIELD QUALITY REQUIREMENTS

- A.

### 3.07 TOLERANCES

- A. Maximum Variation From Required Height: 1/4 inch.
- B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch.

### 3.08 CLEANING

- A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.
- B. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.
- C. Altro Whiterock can be cleaned with a diluted soap/detergent solution, such as Altro 44 Cleaner.
- D. When cleaning the Altro Whiterock surface, we recommend the temperature of water does not exceed 140° F (60° C).
- E. Use cleaning materials compliant with USP regulations, including synthetic, non-shedding mops and specified chemical solutions. Manual unidirectional strokes are recommended to avoid spreading contaminants during cleaning process. Sanitized water is also necessary to thoroughly rinse surfaces.
- F. To reduce the buildup of static, cleaning the panels with an anti-static solution is recommended.
- G. Stubborn stains use AltroClean 44 cleaner or equivalent alkaline cleaner.
- H. Remove construction debris from project site and legally dispose of debris.

### 3.09 PROTECTION

- A. Do not install near open heat sources (ovens, etc). Stainless steel panels should be used in
- B.

3.10 SCHEDULE

- A. Wall Panels: WP-1: WHITEROCK, COLOR: MOCHA / FAWN, 2.5MM THICKNESS  
END OF SECTION 10 2600

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## SECTION 10 2800 TOILET ACCESSORIES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Commercial / Institutional Toilet Accessories.
- B. Public-use washroom accessories.
- C. Staff bathroom accessories.
- D. Warm-air dryers.
- E. Childcare accessories.
- F. Underlavatory guards.
- G. Custodial accessories
- H. Mirrors
- I. Under-lavatory pipe supply covers.
- J. Electric hand/hair dryers.
- K. Diaper changing stations.
- L. Utility room accessories.

#### 1.02 RELATED REQUIREMENTS

- A. Section 09 3000 - Tiling: Ceramic washroom accessories.
- B. Section 10 2113.19 - Plastic Toilet Compartments.
- C. Section 22 4000 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

#### 1.03 ABBREVIATIONS AND ACRONYMS

- A. PPE: Personal Protective Equipment.

#### 1.04 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- B. ASME A112.18.9 - Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures 2011 (Reaffirmed 2022).
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- D. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service 2022.

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TOILET ACCESSORIES



- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.
  - F. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.
  - G. ASTM B86 - Standard Specification for Zinc and Zinc-Aluminum (ZA) Alloy Foundry and Die Castings 2022.
  - H. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium 2017 (Reapproved 2022).
  - I. ASTM C1036 - Standard Specification for Flat Glass 2021.
  - J. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.
  - K. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror 2018.
  - L. ASTM C1822 - Standard Specification for Insulating Covers on Accessible Lavatory Piping 2021.
  - M. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
  - N. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use 2022.
  - O. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi 2015, with Editorial Revision (2021).
  - P. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- 1.05 ADMINISTRATIVE REQUIREMENTS
- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.
  - B. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
  - C. Coordinate the work of this Section with the placement of internal wall reinforcement to receive inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.
- 1.06 SUBMITTALS
- A. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.
  - B. Samples: Submit two samples of each accessory, illustrating color and finish.
    - 1. Full size, for each exposed product and for each finish specified; Approved full-size Samples will remain on site in secure location and may be used in the Work.
  - C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
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 TOILET ACCESSORIES

1. Identify locations using room designations indicated.
  2. Identify accessories using designations indicated.
- D. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.
1. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
  2. Include electrical characteristics.

#### 1.07 INFORMATIONAL and CLOSEOUT SUBMITTALS

- A. Sample Warranty: For manufacturer's special warranty.
- B. Maintenance Data: For accessories to include in maintenance manuals.

#### 1.08 WARRANTY

- A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
  1. Failures include, but are not limited to, visible silver spoilage defects.
  2. Warranty Period: 15 years from date of Substantial Completion.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS and products

- A. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.
- B. See Accessories Schedule below and drawings for basis of design products.
- C. Manufacturers of Public-Use and Staff Toilet Accessories:
  1. Bobrick Washroom Equipment, Inc., [www.bobrick.com](http://www.bobrick.com)
    - a. Bobrick Washroom Equipment, Inc., Clifton Park, New York.
  2. TrueBro Inc., Ellington, CT 06029
  3. Bradley Corporation: [www.bradleycorp.com/#sle](http://www.bradleycorp.com/#sle).
    - a. Bradley Corp., Menomonee Falls WI, 53051
  4. Under-Lavatory Pipe Supply Covers:
    - a. Handicap Lavatory Pipe Insulation Kit (HLPI): Handicap Lavatory P-Trap and Angle Valve Assemblies, shall be insulated with the fully molded, TRUEBRO, "Handi Lav-Guard" insulation kit. Install one (1) Model # 102, to a lavatory in each bathroom having a designated stall for users on a wheel chair. Furnish grey color.
    - b. Plumberex Specialty Products, Inc: [www.plumberex.com/#sle](http://www.plumberex.com/#sle).
    - c. Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
    - d. Material and Finish: Antimicrobial, molded plastic, white.
- D. Toilet Tissue Dispenser (TTD): Public-Use Toilets
  1. Bradley, one per Toilet Compartment.
  2. Description: Unit with double-roll toilet tissue dispenser.
  3. Mounting: Partition mounted, dual access with two tissue rolls per compartment or Partition mounted, dual access with two tissue rolls per compartment and with one side that mounts flush with partition of accessible compartment.

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TOILET ACCESSORIES

4. Toilet Tissue Dispenser Capacity: 4-1/2- or 5-inch-diameter tissue rolls.
  5. Toilet Tissue Dispenser Operation: Controlled delivery with theft-resistant spindles.
  6. Material and Finish: Stainless steel, No. 4 finish (satin) 18 guage.
  7. Lockset: Tumbler type.
- E. Waste Receptacle (WR): Public-Use Toilets
1. 1. Bradley
  2. Mounting: Open top, Semirecessed
  3. Minimum Capacity: 4 Gallon (15 Liter)
  4. Material and Finish: Stainless steel, No. 4 finish (satin)] 18 guage.
  5. Liner: Reusable heavy-duty vinyl liner (Removable); attached at a minimum of four points with stainless steel grommets and hooks.
  6. Lockset: Tumbler type for waste receptacle.
- F. Liquid-Soap Dispenser (SD): Public-Use Toilets
1. Bradley
  2. Description: Designed for dispensing soap in liquid form.
  3. Mounting: Horizontally oriented, surface mounted.
  4. Capacity: Min 12 oz.
  5. Materials: Stainless Steel.
  6. Lockset: Tumbler type.
  7. Refill Indicator: Window type.
  8. Liquid Soap Dispenser to be wall-mounted with stainless steel cover and horizontal stainless steel tank and working parts; push type soap valve, check valve, and window gauge refill indicator, tumbler lock. See drawings for Accessories Schedule.
- G. Grab Bar (GB); Public-Use Toilets and washrooms:
1. Bradley models 8122-00142 and 8122-00136
  2. Mounting: Flanges with concealed fasteners.
  3. Material: Stainless steel, 0.05 inch thick.
    - a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
  4. Outside Diameter: 1-1/2 inches.
  5. Configuration and Length: As indicated on Drawings, Straight, 36 inches long and Straight 48 inches and straight 18 inches Vertical mount as required and as shown on drawings.
  6. Stainless steel, smooth surface. Grab Bars Set (GB): Straddle type concealed mounting, design and tested to sustain 1300 pounds; 1½ inches diameter by 18 gauge 304 stainless steel tubing; fully welded 11 gauge 304 stainless steel mounting flanges; grab bars, shall allow 1½ inches clear space. Furnish one (1) set of three grab bars per each handicap stall and provide in other locations such as staff restrooms and shower stalls in the combinations indicated on drawings.
    - a. Push/Pull Point Load: 250 pound-force, minimum.
    - b. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
    - c. Finish: Satin.
    - d. Length and Configuration: As indicated on drawings.
- H. Towel Pin (TP); Public-Use Toilets and washrooms:
1. Bobrick Model No. B-677
  2. Description: Projecting minimum of 3 3/8 inches from mounting surface. 2x2 inch flange.
  3. Material and Finish: Stainless steel, No. 4 finish (satin) One per Restroom and one per Toilet Compartment.

I. Mirror Unit (MU); Public-Use Toilets and Washrooms:

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TOILET ACCESSORIES

1. Mirrors, Public Restroom: Stainless steel framed, Type 430 polished stainless-steel mirror:
2. Bradley 7481
3. Framed Stainless Steel security mirror: fabricated of 20 gauge type 430 stainless steel, bright annealed. Stretcher leveled for uniform finish. Reflective surface is bright and smooth with a mirror like finish after being polished to a #8 architectural finish. One unit for each standard lavatory except Staff Toilet Room.
4. Frame: Stainless-steel channel.
  - a. Corners: Welded and ground smooth.
5. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.
  - a. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
6. Size: 24x36 inches

J. Electric Hand Dryers (WARM-AIR DRYERS):

1. Dyson.
2. The following may be considered subject to compliance with requirements and with approval:
3. Bradley Corporation, [www.bradleycorp.com](http://www.bradleycorp.com)
4. Excel Dryer: [www.exceldryer.com](http://www.exceldryer.com)

K. Diaper Changing Stations:

1. Bradley Corporation: [www.bradleycorp.com/#sle](http://www.bradleycorp.com/#sle).
2. Diaper Deck & Company: [www.diaperdeck.com/#sle](http://www.diaperdeck.com/#sle).
3. Koala Kare Products: [www.koalabear.com/#sle](http://www.koalabear.com/#sle).
4. Provide products of each category type by single manufacturer.

## 2.02 STAFF BATHROOM ACCESSORIES

- A. Source Limitations: Obtain private-use bathroom accessories from single source from single manufacturer. Provide the following TDs instead of TD and provide MC and TP in addition to all other required items aforementioned including grab bars set of three; Refer to Special Accessories.
- B. Toilet Tissue Dispenser (TDs):
1. Bradley
  2. Description: Single-roll dispenser with hood.
  3. Mounting: Surface mounted.
  4. Capacity: Designed for 4-1/2- or 5-inch-diameter tissue rolls.
  5. Material and Finish: Stainless steel, No. 4 finish (satin).
- C. Medicine Cabinet (MC):
1. Bradley
  2. Mounting: Recessed, for nominal 4-inch wall depth.
  3. Size: 18 by 30 inches.
  4. Door: Framed mirror door concealing storage cabinet equipped with continuous hinge and spring-buffered, rod-type stop and magnetic door catch.
  5. Shelves: Three, adjustable
  6. Material and Finish:
    - a. Cabinet: Stainless steel, No. 4 finish (satin) 20 gauge, type 430 stainless steel.
    - b. Mirror and Frame: Polished Stainless steel.
    - c. Hinge: stainless steel.
    - d. Shelves: Stainless steel, No. 4 finish (satin) 20 gauge.

- D. Towel Pin (TP):
  - 1. Bobrick Model No. B-677
  - 2. Description: Projecting minimum of 3 3/8 inches from mounting surface. 2x2 inch flange.
  - 3. Material and Finish: Stainless steel, No. 4 finish (satin) One per Staff Single User Bathroom.

## 2.03 CHILDCARE ACCESSORIES

- A. Source Limitations: Obtain childcare accessories from single source from single manufacturer.
- B. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
  - 1. Material: Polyethylene.
  - 2. Mounting: Surface.
  - 3. Color: Gray.
  - 4. Minimum Rated Load: 250 pounds.
- C. Diaper-Changing Station (DCS):
  - 1. KoalaKare. Model KB200-05SS
  - 2. Description: Horizontal unit that opens by folding down from stored position and with child-protection strap.
  - 3. Mounting: Surface mounted, with unit projecting not more than 4 inches from wall when closed.
    - a. Engineered to support minimum of 250-lb static load when opened.
  - 4. Operation: By pneumatic shock-absorbing mechanism.
  - 5. Material and Finish: [Stainless steel, No. 4 finish (satin), exterior shell with rounded plastic corners; HDPE interior in manufacturer's standard color.
  - 6. Liner Dispenser: Built in.

## 2.04 UNDERLAVATORY GUARDS

- A. Underlavatory Guard (PG):
  - 1. TruBro
  - 2. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
  - 3. Material and Finish: Antimicrobial, molded plastic, white.

## 2.05 CUSTODIAL ACCESSORIES

- A. Source Limitations: Obtain custodial accessories from single source from single manufacturer.
- B. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
  - 1. Drying rod: Stainless steel, 1/4 inch diameter.
- C. Utility Shelf (US):
  - 1. 1. Bobrick
  - 2. Description: With exposed edges turned down not less than 1/2 inch and supported by two triangular brackets welded to shelf underside.
  - 3. Size: 16 inches long by 6 inches deep
  - 4. Material and Finish: Not less than nominal 0.05-inch-thick stainless steel, No. 4 finish (satin).

- D. Mop and Broom Holder (MH):
  - 1. Bobrick
  - 2. Description: Unit with shelf, hooks, holders, and rod suspended beneath shelf.
  - 3. Length: 36 inches.
  - 4. Hooks: Four (4).
  - 5. Mop/Broom Holders: Three (3), spring-loaded, rubber hat, cam type.
  - 6. Material and Finish: Stainless steel, No. 4 finish (satin).
    - a. Shelf: Not less than nominal 0.05-inch-thick stainless steel.
    - b. Rod: Approximately 1/4-inch-diameter stainless steel

## 2.06 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 2.07 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
  - 1. Grind welded joints smooth.
  - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide 2 keys for each accessory to Owner; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.
- D. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.
- E. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- F. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- G. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- H. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- I. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- J. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
  - 1. Additional Standards: Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.
- K. Adhesive: Two component epoxy type, waterproof.
- L. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
- M. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.
- N. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

2.08 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Back paint components where contact is made with building finishes to prevent electrolysis.

2.09 FABRICATION

- A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.
- B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of 6 keys to Owner's representative.

2.10 Special Toilet Accessories

- A. Provide the following only as specially indicated on drawings.
- B. Paper Towel Dispenser: Manual, roll paper type.
  - 1. Cover: Stainless steel.
  - 2. Paper Discharge: Manual dispense by lever operation.
  - 3. Capacity: 6-inch diameter roll.
  - 4. Mounting: Surface mounted.
  - 5. Refill Indicator: Transparent viewing slot.
  - 6. Products:
    - a. Provide a total of 2 unit(s) of the recessed mounted type per each multi-fixture restroom and one in single occupancy restrooms. The body is fabricated of 22 gauge stainless steel with all welded construction; flange is 1" wide with 1/4" return fabricated in one piece seamless construction 20 gauge satin finish stainless steel; the door is fabricated of 18 gauge stainless steel with full length piano hinge and tumbler lock key. Subject to the wall thickness, this unit shall be a recessed or semi-recessed Bradley model #2481 with a lever operated mechanism. The unit(s) shall be installed in all new built bathrooms, or in a new built wall in a existing bathrooms, or where indicated on the construction drawing in an existing building.
    - b. Provide a surface mounted type, lever operated Roll Towel Dispenser, made of 20 gauge CRS heavy duty steel body with a grey baked enamel finish and 18 gauge CRS top. Front is an Tan color ABS high impact plastic. Provide a unit with a crank mechanism per each existing bathroom of the model #2491 Bradley unless otherwise noted. This unit shall be installed where the recessed housing in the wall is not available.
    - c. AJW Architectural Products; with approval to be equal: [www.ajw.com/#sle](http://www.ajw.com/#sle).
- C. Seat Cover Dispenser: Stainless steel, surface-mounted, reloading by concealed opening at base, tumbler lock.
  - 1. Minimum capacity: 250 seat covers.
  - 2. Products:
    - a. AJW Architectural Products: [www.ajw.com/#sle](http://www.ajw.com/#sle).
    - b. Georgia-Pacific Professional; GP Safe-T-Gard Chrome 1/2 Fold Seatcover Dispenser: [www.blue-connect.com/#sle](http://www.blue-connect.com/#sle).
- D. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.

## 2.11 Electric Hand/Hair Dryers

- A. Source Limitations: Obtain warm-air dryers from single source from single manufacturer. One per two lavatories in Public Use Washrooms and one per Single User Bathroom including Staff Bathrooms.
- B. Multiple Airflow Warm-Air Dryer (HD):
- C. Dyson.
- D. Description: Multiple airflow warm-air hand dryer, using two or more airstreams for rapid hand drying.
- E. Mounting: Surface mounted, with low-profile design.
- F. Operation: Electronic-sensor activated with operation time of 10 seconds.
- G. Cover Material and Finish: Stainless steel, No. 4 finish (satin).
- H. Electrical Requirements: 115 V, 15 A, 1725 W.
- I. The following may be considered subject to compliance with requirements and with approval:
- J. Bradley Corporation, [www.bradleycorp.com](http://www.bradleycorp.com)
- K. Excel Dryer: [www.exceldryer.com](http://www.exceldryer.com)

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify exact location of accessories for installation.
- C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.
- D. Verify that field measurements are as indicated on drawings.

### 3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

### 3.03 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.



- C. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.
- D. Install plumb and level, securely and rigidly anchored to substrate.
- E. Comply with manufacturer's printed instructions, except where more stringent authorities' requirements are mandated by the governing authorities, and except where project conditions require extra precautions or provisions.
- F. Install plumb and level, securely and rigidly anchored in place.
- G. At stud walls, verify that at least one side of the item to install is located so that the fasteners will be set directly into stud. Use fasteners of ¼" x 2½" size. If stud spacing is other than the horizontal distant on centers between the fastener holes, use Rawl 4231 toggles for installation at the opposite side.
- H. At solid masonry walls or ¾ solid CMU no larger than 6", drill pilot holes for installation of Rawl 9220 expansion-type fasteners. At hollow masonry walls, drill pilot holes for installation of Rawl 4231 toggles.
- I. At toilet partitions, use "one-way" "sex-bolt" stainless steel fasteners for installation.
- J. Install metal signs on restroom doors, using molly-jack nuts with stainless steel torx pinhead fasteners.
- K. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
  - 1. Grab Bars: As indicated on drawings.
  - 2. Mirrors: 44" inch, measured from floor to bottom of mirrored surface.
  - 3. Electric Hand Dryers: Measured from floor to bottom of nozzle:
    - a. Men: 44 inches.
    - b. Women: 42 inches.
    - c. Teenager: 41 inches.
    - d. Child: 32 inches.
    - e. Handicap: 36 inches.
  - 4. Other Accessories: As indicated on drawings.

### 3.04 ADJUSTING

- A. Check for proper mechanical functioning and/or rolling operation in not more than five days prior to the Date of Final Completion.
- B. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- C. Remove temporary labels and protective coatings.
- D. Clean and polish exposed surfaces according to manufacturer's written instructions.

### 3.05 cleaning

- A. Upon completion of installation, clean all surfaces that have become soiled during installation. Finished surfaces shall be clean after installation and left free of imperfections.
- B. No evidence of drilling, cutting or patching shall be visible in the finished work. Field touch-up of scratches or damaged finish will not be permitted.

- C. Replace all damaged materials with new.

### 3.06 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

### 3.07 Toilet Accessory Schedule

- A. TA1 post to ceiling urinal screen as specified in other sections.
- B. TA2 floor mounted Toilet Partition system with stall doors and hardware including heavy-duty surface-mounted Coat Hook as specified in other sections.
- C. TA3 - Toilet Tissue Dispenser (TTD): one per Toilet Compartment for 4-1/2 / 5-inch-diameter tissue rolls. Bradley, Partition mounted Unit with double-roll toilet tissue dispenser; HC stall dual access with two tissue rolls per compartment and with one side that mounts flush with partition of accessible compartment. Controlled delivery with theft-resistant spindles; Stainless steel, No. 4 finish (satin) 18 gauge. Lockset: Tumbler type.
- D. TA4 - Toilet Tissue Dispenser (TD) for single restroom: Bradley Designed for 4-1/2- or 5-inch-diameter tissue rolls - Single-roll dispenser with hood; Surface mounted; Stainless steel, No. 4 finish (satin).
- E. TA5 - Towel Pin (TP): Bobrick Model No. B-677; Projecting minimum of 3 3/8 inches from mounting surface. 2x2 inch flange. Stainless steel, No. 4 finish (satin); One wall mounted per Restroom and one stall mounted per Toilet Compartment.
- F. TA6 - Grab Bar (GB): Bradley models 8122-00142 and 8122-00136; Flanges with concealed fasteners Mounting; 0.05 inch thick Stainless steel, No. 4 finish (satin); Smooth Finish on ends and slip-resistant texture in grip area; Outside Diameter: 1-1/2 inches. As indicated on Drawings provide Straight 36" and 48" and 18" (vertical).
- G. TA7 - sanitary napkin receptacle - one per women's room stall - Stainless steel, No. 4 finish (satin)
- H. TA8 - Liquid-Soap Dispenser (SD) one between each Lavatory: Bradley unit Designed for dispensing soap in liquid form 12 oz. Capacity; Horizontally oriented, surface mounted; Stainless steel, No. 4 finish (satin) 18 gauge. Lockset: Tumbler type; Window type Refill Indicator.
- I. TA9 - Underlavatory Guard (PG) on each Lavatory drain: TruBro Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings. Material and Finish: Antimicrobial, molded plastic, white.
- J. TA10 - Waste Receptacle (WR): Bradley Open top, Semi-recessed Mounting; 4 Gallon (15 Liter) Capacity with Reusable vinyl liner; Stainless steel, No. 4 finish (satin) 18 gauge. Lockset: Tumbler type. Provide matching folded paper towel dispenser in recess above.
- K. TA11 - Mirror Unit (MU) One unit for each standard lavatory: Bradley 7481; Framed Stainless Steel security mirror 24x36 inches: fabricated of 20 gauge type 430 stainless steel, bright annealed. Stretcher leveled for uniform finish. Reflective surface is bright and smooth with a mirror finish after being polished to a #8 architectural finish. Stainless-steel channel Frame with Welded and ground smooth Corners. Rigid, tamper- and theft-resistant installation Hangers, using Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.

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TOILET ACCESSORIES

- L. TA12 - Medicine Cabinet (MMC) for single restroom: Bradley 18 by 30 inches Recessed wall mounted. Framed mirror door concealing storage cabinet equipped with continuous hinge and spring buffered, rod-type stop and magnetic door catch. Three adjustable Shelves. Material and Finish: Cabinet: Stainless steel, No. 4 finish (satin) 20 gauge, type 430 stainless steel; Mirror and Frame: Polished Stainless steel; Hinge: stainless steel; Shelves: Stainless steel, No. 4 finish (satin) 20 gauge.
- M. TA13 - Multiple Airflow Warm-Air Dryer (HD): One per two lavatories in Public Use Washrooms and one per Single User restrooms. Dyson - Multiple airflow warm-air hand dryer, using two or more airstreams for rapid hand drying. Surface mounted, with low-profile design. Electronic-sensor activated with operation time of 10 seconds. Cover Material and Finish: Stainless steel, No. 4 finish (satin). Electrical Requirements: 115 V, 15 A, 1725 W.
- N. TA14 - Diaper-Changing Station (DCS) one per public restroom: KoalaKare Model KB200-05SS; Horizontal unit that opens by folding down from stored position and with child protection strap. Engineered to support minimum of 250-lb static load when opened. Surface mounted, with unit projecting not more than 4 inches from wall when closed. Operation: By pneumatic shock-absorbing mechanism. Material and Finish: Stainless steel, No. 4 finish (satin), exterior shell with rounded plastic corners; HDPE interior in manufacturer's standard color. Liner Dispenser: Built in.
- O. TA15 - Utility Shelf (US) one per custodial room: Bobrick 16 inches long by 6 inches deep with exposed edges turned down not less than 1/2 inch and supported by two triangular brackets welded to shelf underside. Material and Finish: Not less than nominal 0.05-inch-thick stainless steel, No. 4 finish (satin).
- P. TA16 - Mop and Broom Holder (MH) one per custodial room: Bobrick - 36 inches Length Unit with shelf, hooks, holders, and rod suspended beneath shelf; 4 Hooks; Mop/Broom Holders: Three (3), spring-loaded, rubber hat, cam type. Material and Finish: Stainless steel, No. 4 finish (satin). Shelf: Not less than nominal 0.05-inch-thick stainless steel. Rod: Approximately 1/4-inch-diameter stainless steel.

END OF SECTION 10 2800

SECTION 10 4415  
FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

- A. Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.

1.02 SECTION INCLUDES:

- A. Furnish and Install: Fire extinguishers and cabinets.
  - 1. semi-recessed for installation into new masonry walls with all code required signage and lighting.
  - 2. surface mounted for installation on existing masonry walls with all code required signage and lighting for projection greater than 4" from wall.
- B. Related Sections: Without limitation, related sections include: Section 09 2215 Interior Non Structural Metal Framing Division 21 Fire Suppression

1.03 SUBMITTALS:

- A. Product Data: Manufacturer's data including instructions, recommendations, and restrictions.
- B. Sustainable Design Submittals: Provide Health Product Declaration (HPD) or material ingredient disclosure.

1.04 DELIVERY, STORAGE, HANDLING:

- A. Comply with Division 1 General Requirements and manufacturer's instructions and recommendations.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. JL Industries, division of Activar Construction Products Group, [www.jlindustries.com](http://www.jlindustries.com)
- B. Larsen's Manufacturing Company, [www.larsensmfg.com](http://www.larsensmfg.com)
- C. Potter Roemer, division of Acorn Engineering Company [www.potterroemer.com](http://www.potterroemer.com)

2.02 FIRE EXTINGUISHER CABINETS:

- A. Basis of Design: "Architectural Series", Larsen's Manufacturing Company.
- B. Mounting:
  - 1. Semi-recessed with =2.5 inches projection; typical UNO.
  - 2. Surface mounted where shown on drawings.
  - 3. Bracket mounted where shown on drawings.

- C. Door Material, Finish: Steel, factory painted white.
- D. Door Style: Vertical duo panel, safety glass.
- E. Latch: Roller catch.
- F. Pull: Satin chrome "staple" pull.
- G. Door Lettering: Black, vinyl die cut, vertical, all capitals.

2.03 FIRE EXTINGUISHERS:

- A. Filled, charged, pressurized, tagged, dated, and rechargeable.
  - 1. Listing: Underwriters Laboratories and FM approved.
  - 2. Container: Painted steel.
  - 3. Agent: Multi purpose dry chemical A-B-C.
  - 4. Agent Capacity: 10 pounds.
  - 5. UL Rating: 4-A:80-B:C.

PART 3 - EXECUTION

3.01 CABINET INSTALLATION:

- A. Comply with manufacturer's instructions and recommendations.
  - 1. Coordinate rough in and concealed blocking.
  - 2. Install at height shown or, if not shown, barrier free Code complying and approved by Architect.
  - 3. Install plumb and level.
  - 4. Anchor securely.
    - a. Provide one fastener for each factory provided fastener hole.
    - b. Conceal fasteners within cabinet.
  - 5. If not factory applied, apply signage plumb and level and aligned with door edge.
  - 6. Restore damaged finishes to eliminate evidence of repair.
  - 7. Place items inside cabinets.

3.02 ADDITIONAL REQUIREMENTS FOR FIRE RATED WALLS:

- A. Provide complete cabinet assembly which maintains the assembly fire rating.

END OF SECTION 10 4415

SECTION 10 5617  
WALL MOUNTED STANDARDS AND SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Steel shelf standards, brackets, and accessories.
- B. Steel shelf support brackets.
- C. Closet rods for mounting on brackets.
- D. Steel Shelves.
- E. See drawings for locations and configurations.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood blocking in walls for attachment of standards.
- B. Section 06 2000 - Finish Carpentry: Wood shelves.
- C. Section 09 2116 - Gypsum Board Assemblies: Blocking in metal stud walls for attachment of standards.

1.03 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.
- B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2021.
- C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2021.
- D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- E. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- F. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.
- G. NEMA LD 3 - High-Pressure Decorative Laminates 2005.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used.

- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements for additional provisions.
  - 2. Extra Brackets: Ten of each size of standard straight bracket.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

#### 1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products under cover and elevated above grade.
- B. Store products in manufacturer's unopened packaging until ready for installation.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Steel Shelf Standards and Brackets:
  - 1. Knapé & Vogt Manufacturing Company; 87™/187™ Series: [www.knapandvogt.com/#sle](http://www.knapandvogt.com/#sle).
- B. Steel Shelf Support Brackets:
  - 1. Centerline Brackets; Floating Wall Mount: [www.countertopbracket.com/#sle](http://www.countertopbracket.com/#sle).
- C. Shelving:
  - 1. Painted Steel Shelves to match standards and brackets in color and gage.

#### 2.02 COMPONENTS

- A. Steel Shelf Standards, Brackets, and Accessories:
  - 1. Super-Duty Shelf Standards and Brackets: Single-slotted channel standards for brackets adjustable in 1 inch increments along entire length of standard, drilled and countersunk for screws.
    - a. Product: KV 87/187.
    - b. Load Capacity: Recommended by manufacturer for loading of 540 to 1,060 pounds per pair of standards.
    - c. Face Width: 5/8 inch, single slotted.
    - d. Material: 12 gauge, 0.1046 inch sheet steel.
    - e. Lengths: As indicated on drawings.
    - f. Finish: Electroplated, chrome-look.
    - g. Brackets: 12 gauge, 0.1046 inch sheet steel, reinforced, locking into slots with molded nylon cam lock lever; size to suit shelves; same finish as standards.
    - h. Application: Use extra heavy duty standards at locations as indicated on drawings.
    - i. Bracket Quantity: Provide one bracket for each 12 inches of standard length.
  - 2. Extra-Duty Shelf Standards and Brackets: Double-slotted channel standards for brackets adjustable in 1 inch increments along entire length of standard, drilled and countersunk for screws.

- a. Product: KV 85/187.
  - b. Load Capacity: Recommended by manufacturer for loading of 300 to 680 pounds per pair of standards.
  - c. Finish: Electroplated, chrome-look.
  - d. Brackets: Double tab type, locking into slots; size to suit shelves; same finish as standards.
  - e. Bracket Quantity: Provide one bracket for each 12 inches of standard length.
3. Heavy-Duty Shelf Standards and Brackets: Double-slotted channel standards for brackets adjustable in 1 inch increments along entire length of standard, drilled and countersunk for screws.
- a. Product: KV 82/182.
  - b. Load Capacity: Recommended by manufacturer for loading of 300 to 450 pounds per pair of standards.
  - c. Lengths: As indicated on drawings.
  - d. Finish: Powder-coated.
  - e. Color: To be selected by Architect from manufacturer's full line.
  - f. Brackets: Double tab type, locking into slots; size to suit shelves; same finish as standards.
  - g. Provide snap-in cover strips to hide unused slots and screw holes.
  - h. Application: Use decorative heavy duty standards at at locations as indicated on drawings.
  - i. Bracket Quantity: Provide one bracket for each 12 inches of standard length.
4. Heavy-Duty Shelf Standards and Brackets: Single-slotted channel standards for brackets adjustable in 1 inch increments along entire length of standard, drilled and countersunk for screws.
- a. Product: KV 83/183.
  - b. Load Capacity: Recommended by manufacturer for loading of 300 to 450 pounds per pair of standards.
  - c. Lengths: As indicated on drawings.
  - d. Finish: Powder-coated.
  - e. Color: To be selected by Architect from manufacturer's full line.
  - f. Brackets: Double tab type, locking into slots; size to suit shelves; same finish as standards.
  - g. Provide snap-in cover strips to hide unused slots and screw holes.
  - h. Application: Use decorative heavy duty standards at at locations as indicated on drawings.
  - i. Bracket Quantity: Provide one bracket for each 12 inches of standard length.
5. Regular-Duty Shelf Standards and Brackets: Single-slotted channel standards for brackets adjustable in 1 inch increments along entire length of standard, drilled and countersunk for screws.
- a. Product: KV 70/170.
  - b. Load Capacity: Recommended by manufacturer for loading of 120 to 320 pounds per pair of standards.
  - c. Material: 16 gauge, 0.0598 inch sheet steel.
  - d. Lengths: As indicated on drawings.
  - e. Finish: Zinc coated.
  - f. Brackets: 14 gauge, 0.0747 inch sheet steel, locking into slots; size to suit shelves; zinc coated finish.
  - g. Application: Use standard duty standards at at locations as indicated on drawings.
  - h. Bracket Quantity: Provide one bracket for each 12 inches of standard length.
6. Shelf Standard Accessories:
- a. At shelves indicated as sloping provide adjustable slant brackets.
  - b. Where cornices are indicated as part of shelving provide cornice brackets.



- c. Where shelves are indicated to be fastened to brackets provide brackets with flanges for screwing into end of shelf, steel shelf rests, or flanged brackets; fasten with screws.
    - d. At glass shelves provide clear plastic shelf rests, front and back, with rubber cushions.
    - e. Provide other accessories as indicated.
  - 7. Closet Rods: Steel tubing for wall mounting in flange fittings.
    - a. Type: Oval chrome look, extra heavy duty, welded seam; 1.18 inches high by 0.59 inches wide, 0.047 inch wall thickness.
    - b. Length: As required for application, up to 12 feet.
    - c. Provide mounting fittings to suit application.
- B. Steel Shelf Support Brackets:
  - 1. Material: Steel, ASTM A36/A36M.
  - 2. Bracket Type: L-shaped, with predrilled mounting holes on vertical leg for attachment to wood stud or blocking.
  - 3. Bracket Horizontal Support Length: As indicated on drawings.
  - 4. Bracket Thickness: 3/8 inch.
  - 5. Finish: White powdercoat.
- C. Shelving:
  - 1. Painted Steel Shelves to match standards and brackets in color and quality.
    - a. Shelf Capacity: Uniform distributed load of 50 psf, minimum.
    - b. Shelf Deflection: 1/4 inch in 36 inches, maximum, under specified uniform load.
    - c. Shelf Thickness: as required to meet criteria.
    - d. Shelf Length: 36 inches.
    - e. Shelf Depth: 4 inches.
    - f. Finish: As selected by Architect from manufacturer's full line.
  - 2. Wood Shelves: Solid board shelves, with edges sanded and eased.
    - a. Species: as indicated on drawings, otherwise provide painted steel.
    - b. Thickness: 3/4 inch, nominal.
    - c. Finish: Polyurethane varnish.
- D. Fasteners: Screws as recommended by manufacturer for intended application or as otherwise required by project conditions. Finish of exposed to view fasteners to match finish of standards and other components.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### 3.02 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Mount standards or brackets to solid backing capable of supporting intended loads.
- C. Install brackets, shelving, and accessories.

3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 10 5617

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SECTION 10 5723  
CLOSET AND UTILITY SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall mounted wire closet shelving.
- B. Laminated shelves associated with wire shelving.
- C. Laminated wood storage systems.
- D. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Blocking in walls for attachment of shelving or storage system.
- B. Section 09 2116 - Gypsum Board Assemblies: Blocking in metal stud walls for attachment of standards or mounting rails.

1.03 REFERENCE STANDARDS

- A. NEMA LD 3 - High-Pressure Decorative Laminates 2005.

1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, with installation instructions.
- C. Shop Drawings: Provide drawings prepared specifically for this project; show dimensions of shelving or storage system and attachment to substrates.
- D. Selection Samples: For each color selection required, submit color chips representing manufacturer's full range of available colors and finish.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products under cover and elevated above grade.
- C. Store flat to prevent warpage and bending.

1.07 FIELD CONDITIONS

- A. Maintain temperature, humidity, and ventilation within limits recommended by manufacturer. Do not install products under environmental conditions outside manufacturer's limits.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wire Storage Shelving:
  - 1. Rubbermaid, Inc; Wire Closets: [www.rubbermaidpro.com/#sle](http://www.rubbermaidpro.com/#sle).

2.02 WIRE STORAGE SHELVING SYSTEMS

- A. Applications:
- B. Wire Shelving: Factory-assembled coated wire mesh shelf assemblies for wall-mounting, with components and connections required to produce a rigid structure that is free of buckling and warping.
  - 1. Construction: Cold-drawn steel wire with average tensile strength of 100,000 psi resistance welded into uniform mesh units, square, rigid, flat, and free of dents or other distortions, with wires trimmed smooth.
  - 2. Coating: PVC or epoxy, applied after fabrication, covering surfaces.
  - 3. PVC Coating: 9 to 11 mils thick.
  - 4. Epoxy Coating: Nontoxic epoxy-polyester powder coating baked-on finish, 3 to 5 mils thick.
  - 5. Standard Mesh Shelves: Cross deck wires spaced at 1 inch.
- C. Mounting Hardware for Wire Shelving: Provide manufacturer's standard mounting hardware; include support braces, wall brackets, back clips, end clips, poles, and other accessories as required for complete and secure installation; factory finished to match shelving.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Inspect areas to receive shelving or storage system, to verify that spaces are properly prepared to receive shelf units, and are of dimensions indicated on shop drawings.
- B. Verify appropriate fastening hardware.
- C. Do not begin installation until substrates have been properly prepared.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

- A. Install wire shelving in accordance with manufacturer's instructions, with shelf surfaces level.
- B. Cap exposed ends of cut wire shelving.
- C. Install wire shelving back clips, end clips at side walls, and support braces at open ends. Install intermediate support braces as recommended by manufacturer.

3.03 CLEANING

- A. Clean soiled surfaces after installation.

3.04 PROTECTION

- A. Protect installed work from damage.
- B. Touch-up, repair, or replace damaged products before Substantial Completion in a manner that eliminates evidence of replacement.

END OF SECTION 10 5723

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SECTION 10 8213  
EXTERIOR ENCLOSURES AND SCREENS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Complete systems for anti-trespass Exterior fencing and screens attached to and including delegated design structure as follows:
- B. Complete system for anti-trespass vertical (louvered wall panel and anti-trespass fencing) and horizontal (chain link canopy) enclosure Mechanical equipment using the following systems:
- C. Complete delegated design Steel Louver Panel Mechanical Enclosure System; see below for anti-trespass fencing.
- D. Complete delegated design system of horizontal chain link canopy with supports for anti-trespass enclosure of Mechanical equipment attached to delegated design support structure for vertical (louvered wall panel).
- E. Complete delegated design system for anti-trespass fencing for Stair vertical enclosure including delegated design support structure attached to delegated stair framing (Refer to specification section for delegated design exterior emergency egress stair) using the following systems:
- F. High Security Welded Wire Architectural Anti-Climb Fence System; (anti-trespass fencing).
- G. Provide all required Galvanized Steel Tube Framing, Anchors, Fasters, Foundations and other components for complete system for all of the aforementioned.
- H. Exterior grilles and screens misc. attachments to structure.

1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Mounting substrates.
- B. Section 04 2000 - Unit Masonry: Mounting substrates.
- C. Section 05 1200 - Structural Steel Framing: Mounting substrates.
- D. Section 05 5100 - Metal Stairs: Mounting substrates.
- E. Section 05 5000 - Metal Fabrications: For criteria for steel galvanizing and metal finishes not define with-in this section.

1.03 REFERENCE STANDARDS

- A. AAMA 612 - Voluntary Specification, Performance Requirements, and Test Procedures for Combined Coatings of Anodic Oxide and Transparent Organic Coatings on Architectural Aluminum 2020, with Errata (2022).
- B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.



- C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
  - D. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.
  - E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.
  - F. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process 2022.
  - G. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2021a.
  - H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
  - I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.
  - J. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position 2022.
  - K. ASTM D1187/D1187M - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal 1997 (Reapproved 2018).
  - L. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics 2020.
  - M. ASTM D2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics 2022.
  - N. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023.
  - O. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs 2022.
  - P. NFPA 268 - Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source 2022.
  - Q. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components 2023.
  - R. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films 2023.
- 1.04 ADDITIONAL REFERENCE STANDARDS
- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process
  - B. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus
  - C. ASTM D523 - Test Method for Specular Gloss
  - D. ASTM D714 - Test Method for Evaluating Degree of Blistering in Paint

- E. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
- F. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates
- G. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
- H. ASTM D3359 - Test Method for Measuring Adhesion by Tape Test
- I. ASTM D6695 – Standard Practice for Xenon-Arc Exposures of Paint and Related Coatings
- J. ASTM F2453/F 2453M – Standard Specification for Welded Wire Mesh Fence Fabric

#### 1.05 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Submit detailed shop drawings, indicating component profiles, sections, finishes, fastening details, special details, and manufacturer's technical and descriptive data.
  - 1. Include field dimensions of openings and elevations on shop drawings.
  - 2. Indicate distinction between factory-assembled and field-assembled work on shop drawings.
- C. Samples: Submit samples for color verification, 10 inches by 10 inches minimum.
- D. Samples: Submit assembled sample 24 inches by 24 inches minimum size to illustrate design, fabrication techniques, workmanship, and finish color.
- E. Design Data: Submit comprehensive structural analysis of design for the specified loads. Stamp and sign calculations by professional engineer.
- F. Designer's Qualification Statement.
- G. Manufacturer's Qualification Statement.
- H. Installer's Qualification Statement.
- I. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### 1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Perform structural design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified and with minimum three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to project site in manufacturer's original, unopened packaging, with labels clearly identifying manufacturer and material.
- B. Store materials indoors, protected from moisture, humidity, and extreme temperature fluctuations.

1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a one year period after Date of Substantial Completion.
- C. Finish Warranty: Provide manufacturer's ten year warranty on factory finish against cracking, peeling, and blistering.

PART 2 PRODUCTS

2.01 MANUFACTURERS AND BASIS OF DESIGN SYSTEM

- A. High Security Welded Wire Architectural Anti-Climb Fence System:
  - 1. Ameristar® WireWorks Anti-Climb® design by Ameristar Perimeter Security USA Inc. in Tulsa, Oklahoma.
- B. Steel Louver Panel Mechanical Enclosure System:
  - 1. Shadow 80 Design Galvanized Steel Fixed Louver Fence by AMETCO Manufacturing Corporation; 4326 HAMANN Parkway, PO Box 1210, Willoughby, OH 44096
- C. Galvanized Steel Delegated Design Horizontal Chain-link Canopy Enclosure; Product to support minimum live load of 250 pounds by an acceptable manufacturer and Installed by installer acceptable to the aforementioned Manufacturers.

2.02 GRILLES: METAL MESH VERTICAL AND HORIZONTAL SYSTEMS

- A. Basis of Design: High Security Welded Wire Architectural Anti-Climb Fence System by Ameristar WireWorks Anti-Climb by Ameristar Perimeter Security, AMETCO Manufacturing Corporation.
- B. Galvanized Steel Delegated Design Horizontal Chain-link Canopy Enclosure; Product to support minimum live load of 250 pounds by an acceptable manufacturer and Installed by installer acceptable to the Manufacturer of High Security Welded Wire Architectural Anti-Climb Fence System and system to be similar.

2.03 SCREENS

- A. Steel Louvered Screens: Provide shop fabricated, shop finished screens assembled into panels.
- B. Basis of Design: Steel Louver Panel Mechanical Enclosure System: Shadow 80 Design Galvanized Steel Fixed Louver Fence by AMETCO Manufacturing Corporation.
- C. Galvanized Steel Fixed Louver Fence: Weight per square foot is 2.84 pounds.

## 2.04 MATERIALS

- A. Concealed Structural Supports: galvanized steel coated for corrosion resistance and dissimilar metal isolation.
- B. Stainless Steel Tensioning Tubes: ASTM A276/A276M.
- C. Steel material for fence posts and rails shall be galvanized prior to forming in accordance with the requirements of ASTM A653/A653M, with minimum yield strength of 45,000 psi (310 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft<sup>2</sup>, Coating Designation G-90. Fence posts and gate posts shall meet the minimum size requirements of manufacturer.
- D. Steel wire mesh fence panels shall be manufactured to meet ASTM F2453. Fence panels shall be pre-galvanized steel wire, welded at each crossing to form rectangles. Standard panel offering shall be 10.5ga. (0.128 inches) vertical wires spaced at 3 inches; horizontal 10.5ga. (0.128 inches) wires shall be spaced at .5 inches. Optional panel offering shall be 8ga. (0.162 inches) vertical wires spaced at 3 inches; horizontal 8ga. (0.162 inches) wires shall be spaced at .5 inches. The cold rolled wire shall have a tensile strength of at least 74,000 psi and 68,000 psi shear strength. Wire strand shall be galvanized before welded (GBW), .50 ounces per square foot zinc coating conforming to the ASTM A641.
- E. The cross-sectional shape of the rails shall conform to the manufacturer's Impasse II™ C-rail design, a nominal 2" x 2" x 11 Ga. Tamperproof fasteners shall be used to fasten each wire mesh retaining bracket to rail at intervals not exceeding 18 inches. Posts shall conform to the manufacturer's Impasse II™ I-Beam design with a nominal 3" x 2.75" x 12 Ga. up to 8-foot height, and 4" x 2.75" x 11 Ga. up to 10-foot height.

## 2.05 FABRICATION

- A. Shop fabricate grilles and screens to the greatest extent possible.
- B. Disassemble as necessary for shipping and handling, clearly mark units for proper reassembly.
- C. Provide supports, anchorages, and accessories as required for complete assembled system.
- D. Provide inserts as required for installation into concrete or masonry based support materials.
- E. Fabricate grilles to ensure proper fit into openings of sizes indicated, with tolerances for installation.
- F. Attach grille panels to each other by welding, unless otherwise indicated.
- G. Wire mesh panels and posts shall be precut to specified lengths. Panel width shall be no greater than 96" wide.
- H. The manufactured fence system (i.e., panels, brackets, posts, gates, and hardware) shall be subjected to the PermaCoat® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, White, Desert Sand, Green, or Brown). The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2.

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EXTERIOR ENCLOSURES AND SCREENS

- I. Swing gates shall be fabricated using 2" x 12ga square rails and gate ends. Gates that exceed 6' in width will have a 2" x 4" x 12ga. intermediate upright. All rail and upright intersections shall be joined by welding. All rail, upright, and gate end intersections shall also be joined by welding. Steel gussets (1/4" x 2") shall be welded at each rail to gate end and rail to intermediate intersections. Gusset shall be punched to accept gate trussing cable and turnbuckle.

## 2.06 FINISHES

- A. Finish Color: As selected by Architect from manufacturer's standard color range.

## 2.07 ACCESSORIES

- A. Fasteners: ASTM F593 stainless steel or ASTM A307 carbon steel, sizes to suit installation conditions.
- B. Anchors and Inserts: Corrosion resistant; type, size, and material required for loading and installation as indicated.
- C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other work.
- B. Verify that painting, roofing, masonry work, and other adjacent work that might damage grille finish have been completed prior to start of installation.
- C. Verify that anchorage devices have been properly installed and located.

### 3.02 INSTALLATION

- A. Install in accordance with manufacturer's written installation instructions.
- B. Coat concealed metal surfaces that will be in contact with cementitious materials or dissimilar metals with bituminous paint, and allow paint to dry prior to installation of aluminum components.
- C. Set grilles level, plumb, with uniform joints, and in alignment with adjacent work as indicated.
- D. Mechanically secure grilles to supporting structure.
- E. Do not cut or trim aluminum members without approval of manufacturer; do not install damaged members.
- F. FENCE INSTALLATION:
  1. Fence post shall be spaced according to Table 3, plus or minus 1/4". For post installations that must follow sloping grades, the post spacing dimension must be measured along grade. WireWorks Anti-Climb panels are fixed and are not intended to follow grade, however in some cases mesh panels may stair-step to follow minor grade changes with a non-typical installation method of overlapping and shorter panel widths.

2. Fence panels shall be attached to the line and end posts with fasteners supplied by the manufacturer. Attachment to corner post shall be made using brackets and fasteners supplied by the manufacturer (See Figure 1). Posts shall be set in concrete footers having a minimum depth of 36" (Note: In some cases, local restrictions of freezing weather conditions may require a greater depth). The "Earthwork" and "Concrete" sections of this specification shall govern material requirements for the concrete footer. Posts setting by other methods such as plated posts or grouted core-drilled footers are permissible only if shown by engineering analysis to be sufficient in strength for the intended application.

G. FENCE INSTALLATION MAINTENANCE:

1. When cutting/drilling rails or posts adhere to the following steps to seal the exposed steel surfaces; 1) Remove all metal shavings from cut area. 2) Apply zinc-rich primer to thoroughly cover cut edge and/or drilled hole; let dry. 3) Apply 2 coats of custom finish paint matching fence color. Failure to seal exposed surfaces per steps 1-3 above will negate warranty. Ameristar spray cans or paint pens shall be used to prime and finish exposed surfaces; it is recommended that paint pens be used to prevent overspray. Use of non-Ameristar parts or components will negate the manufactures' warranty.

H. GATE INSTALLATION:

1. Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles. The manufacturers' gate drawings shall identify the necessary gate hardware required for the application. Gate hardware shall be provided by the manufacture of the gate and shall be installed per manufacturer's recommendations.

3.03 CLEANING

- A. Remove temporary protective covering as grilles are installed.
- B. Clean finished surfaces as recommended by manufacturer and maintain clean condition until Date of Substantial Completion.
- C. Touch-up damaged finish coating using material provided by manufacturer to match original coating.
- D. Replace grilles that have been damaged beyond touch-up repair.
- E. The contractor shall clean of excess materials; post-hole excavations shall be scattered uniformly away from posts.

3.04 PROTECTION

- A. Protect installed grilles to ensure grilles are without damage until Date of Substantial Completion.

END OF SECTION 10 8213

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## SECTION 11 3013 RESIDENTIAL APPLIANCES

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Kitchen appliances as shown on drawings.

#### 1.02 RELATED REQUIREMENTS

- A. Section 22 1005 - Plumbing Piping: Plumbing connections for appliances.
- B. Section 26 0583 - Wiring Connections: Electrical connections for appliances.

#### 1.03 REFERENCE STANDARDS

- A. UL (DIR) - Online Certifications Directory Current Edition.

#### 1.04 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
- C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

#### 1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Electric Appliances: Listed and labeled by UL (DIR) and complying with NEMA Standards (National Electrical Manufacturers Association).
- C. Gas Appliances: Bearing design certification seal of American Gas Association (AGA).

#### 1.06 WARRANTY

- A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.
- C. Provide ten (10) year manufacturer warranty on magnetron tube of microwave ovens.

### PART 2 PRODUCTS

#### 2.01 KITCHEN APPLIANCES

- A. Provide Equipment Eligible for Energy Star Rating: Energy Star Rated.

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RESIDENTIAL APPLIANCES



- B. Refrigerator: Free-standing, side-by-side, and frost-free.
1. Capacity: Total minimum storage of 18 cubic ft; minimum 15 percent freezer capacity.
  2. Energy Usage: Minimum 20 percent more energy efficient than energy efficiency standards set by U.S. Department of Energy (DOE).
  3. Features: Include .
  4. Provide either of the following or equal from manufacturers listed below:
    - a. GE Energy Star 28in 11.6 cu.ft. Top Freezer Refrigerator in White with LED light type model GPE12FSKSB
    - b. GE Energy Star 28in 16.6 cu.ft. Top Freezer Refrigerator in White with LED light type model GTS17DTNRWW
  5. Exterior Finish: Porcelain enameled steel, color as indicated.
  6. Manufacturers:
    - a. Frigidaire Home Products: [www.frigidaire.com/#sle](http://www.frigidaire.com/#sle).
    - b. GE Appliances: [www.geappliances.com/#sle](http://www.geappliances.com/#sle).
    - c. Whirlpool Corp: [www.whirlpool.com/#sle](http://www.whirlpool.com/#sle).
- C. Range: Electric, free-standing, with glass-ceramic cooktop.
1. Size: 30 inches wide.
  2. Oven: Self-cleaning with electronic ignition.
  3. Elements: Four (4).
  4. Controls: Solid state electronic.
  5. Features: Include automatic meat thermometer, storage drawer, oven door window, broiler pan and grid, oven light, and as indicated on drawings.
  6. Exterior Finish: Porcelain enameled steel, color as indicated.
  7. Manufacturers:
    - a. Frigidaire Home Products: [www.frigidaire.com/#sle](http://www.frigidaire.com/#sle).
    - b. GE Appliances: [www.geappliances.com/#sle](http://www.geappliances.com/#sle).
    - c. Whirlpool Corp: [www.whirlpool.com/#sle](http://www.whirlpool.com/#sle).
- D. Cooking Exhaust: Range hood.
1. Size: 42 inches wide.
  2. Fan: Two-speed, 500 cfm
  3. Exhaust: Rectangular, vented to exterior.
  4. Features: Include cooktop light, night light, backdraft damper, removable grease filter, retractable visor, and as indicated on drawings.
  5. Exterior Finish: Painted steel, color as indicated.
  6. Manufacturers:
    - a. Broan-NuTone, LLC; BCDF130SS Under-Cabinet Range Hood: [www.broan-nutone.com/#sle](http://www.broan-nutone.com/#sle).
    - b. Frigidaire Home Products: [www.frigidaire.com/#sle](http://www.frigidaire.com/#sle).
    - c. GE Appliances: [www.geappliances.com/#sle](http://www.geappliances.com/#sle).
    - d. Whirlpool Corp: [www.whirlpool.com/#sle](http://www.whirlpool.com/#sle).
- E. Microwave: Countertop.
1. Capacity: 0.7 cubic ft.
  2. Power: 700 watts.
  3. Features: Include .
  4. Exterior Finish: Black.
  5. Manufacturers:
    - a. Frigidaire Home Products: [www.frigidaire.com/#sle](http://www.frigidaire.com/#sle).
    - b. GE Appliances: [www.geappliances.com/#sle](http://www.geappliances.com/#sle).
    - c. Whirlpool Corp: [www.whirlpool.com/#sle](http://www.whirlpool.com/#sle).

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify utility rough-ins are provided and correctly located.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Anchor built-in equipment in place.

3.03 ADJUSTING

- A. Adjust equipment to provide efficient operation.

3.04 CLEANING

- A. Remove packing materials from equipment and properly discard.
- B. Wash and clean equipment.

END OF SECTION 11 3013

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SECTION 116800  
PLAY EQUIPMENT AND STRUCTURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes equipment as follows:
  - 1. Playground Equipment manufactured by KOMPAN.
  - 2. Musical Play Equipment manufactured by Landscape Structures.

1.3 DEFINITIONS

- A. Definitions in ASTM F1487 apply to Work of this Section.
- B. IPEMA: International Play Equipment Manufacturers Association.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Kingsessing Playground, 4901 Kingsessing Avenue, Philadelphia, PA 19143.
  - 1. Attendees include KOMPAN Representative, Landscape Structures Representative, General Contractor, and Equipment Installer.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of playground and fitness equipment.
  - 1. Include plans, elevations, sections, and attachment details.
  - 2. Include fall heights and use zones for playground and fitness equipment, coordinated with the critical-height values of protective surfacing specified in Section 321816.13 "Playground Protective Surfacing."
- C. Samples for Initial Selection: For each type of exposed finish.
  - 1. KOMPAN and Landscape Forms color charts.

2. Include Samples of accessories involving color selection.
- D. Samples for Verification: For each type of exposed finish on the following products:
1. Include Samples of accessories to verify color and finish selection.
  2. Posts and Rails: Minimum 6 inches long.
  3. Platforms: Minimum 6 inches square.
  4. Molded Plastic: Minimum 3 inches square.
- E. Product Schedules: For Playground Equipment and Fitness Equipment, use same designations as indicated on Drawings.

#### 1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and testing agency.
- B. Product Certificates: For each type of playground and fitness equipment.
- C. Material Certificates: For the following items:
1. Shop finishes.
- D. Field quality-control reports.
- E. Sample Warranty: For manufacturer's special warranties.

#### 1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For playground and fitness equipment and finishes to include in maintenance manuals.

#### 1.8 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm whose playground and fitness equipment components have been certified by IPEMA's third-party product certification service.
1. Playground and fitness equipment manufacturer must be approved by Philadelphia Parks and Recreation (PPR).
- B. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by the manufacturer.

#### 1.9 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of playground and fitness equipment that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:
  - a. Structural failures.
  - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
2. KOMPAN Warranty Period:
  - a. Lifetime Warranty: galvanized structural parts including steel poles, cross beams, floor frames, and top brackets; stainless steel hardware; and EcoCore™ and other HDPE panels.
  - b. Ten (10) Year Warranty: HPL floors and panels; galvanized and aluminum metal parts with painted top layer; other galvanized metal parts; other stainless-steel parts; Corocord rope; “S” clamps of stainless steel; solid plastic parts; hollow plastic parts; non-painted metal parts; Robinia & Siberian larch wood; and other engineered timber.
  - c. Five (5) Year Warranty: resin coated plywood plates; other painted metal parts; springs and ball bearing assemblies; other rope and net constructions; and concrete elements.
  - d. Two (2) Year Warranty: movable plastic and metal parts; EPDM rubber membranes material; electronic components; and sunshades and sail solutions.
3. KOMPAN Warranty Coverage:
  - a. The warranty applies to KOMPAN’s products for the time periods described for each product type above and with the limitations described in the warranty. The warranty period applies from the date of purchase by the first customer. The warranty covers only defects in materials. KOMPAN’s liability under the warranty is limited to repair or replacement of defective products, without charge, at KOMPAN’s discretion. Defective electronic components will be delivered and changed by a KOMPAN ICON Professional installer free of charge.
  - b. The warranty applies only if products have been properly installed according to the instructions provided by KOMPAN, and maintained correctly according to the KOMPAN Maintenance Manual. The warranty for ICON electrical components is dependent on those products being installed by an ICON trained and approved installer.
  - c. The warranty does not cover damage caused by accident, improper care, negligence, normal wear and tear, surface corrosion on metal parts, discolored surfaces and other cosmetic issues or failures due to misuse or vandalism. Natural changes in wood over time are considered cosmetic issues and are not covered.

- d. KOMPAN provides non-KOMPAN branded products and installation services performed by certified third party suppliers. The general KOMPAN warranty does not apply to such non-KOMPAN branded products and installation services, which may carry their own warranties. KOMPAN will pass on information about such warranties where possible.
- e. KOMPAN's Lifetime Warranty is in effect for the lifetime of the product until the product is uninstalled and / or taken out of use.
- f. KOMPAN's general terms and delivery conditions apply and supplement the warranty.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Source Limitations: Obtain playground and musical play equipment from the following approved manufacturers:
  - 1. KOMPAN Inc.  
Matt Burns, Principal Sales Representative  
Mobile: 310-775-5082  
Email: [MatBur@Kompan.com](mailto:MatBur@Kompan.com)  
[www.kompan.us](http://www.kompan.us)
  - 2. Landscape Structures, Inc.  
Andy Cush, Sales Representative  
General Recreation, Inc.  
Newtown Square, PA 19073  
Office: 800-726-4793  
Email: [andy@gen-rec.com](mailto:andy@gen-rec.com)
- B. Playground equipment and components shall have the IPEMA Certification Seal.

### 2.2 PLAYGROUND EQUIPMENT

- A. See Site Furnishings Schedule on Drawings for product information.

### 2.3 MUSICAL PLAY EQUIPMENT

- A. See Site Furnishings Schedule on Drawings for product information.

## 2.4 CAST-IN-PLACE CONCRETE

- A. Concrete Materials and Properties: Dry-packaged concrete mix complying with ASTM C387/C387M and mixed at site with potable water, according to manufacturer's written instructions, for normal-weight concrete with minimum 28-day compressive strength, slump, and aggregate size per manufacturer's instructions.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for earthwork, subgrade elevations, surface and subgrade drainage, and other conditions affecting performance of the Work.
  - 1. Do not begin installation before final grading required for placing playground and fitness equipment and protective surfacing is completed.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Comply with KOMPAN's and Landscape Structures' written installation instructions for each equipment type unless more stringent requirements are indicated. Anchor playground equipment securely, positioned at locations and elevations indicated.
  - 1. Maximum Equipment Height: Coordinate installed fall heights of equipment with finished elevations and critical-height values of protective surfacing. Set equipment so fall heights and elevation requirements for age group use and accessibility are within required limits. Verify that equipment elevations comply with requirements for each type and component of equipment.
- B. Post and Footing Excavation: Excavate holes for posts and footings as indicated in firm, undisturbed or compacted subgrade soil.
- C. Post Set on Subgrade: Level bearing surfaces with drainage fill to required elevation.
- D. Post Set with Concrete Footing: Comply with ACI 301, dry-packaged concrete-mix manufacturer's written instructions for measuring, batching, mixing, transporting, forming, and placing concrete.
  - 1. Set equipment posts in or on concrete footing per equipment KOMPAN's instructions. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at the correct angle, alignment, height, and spacing.
    - a. Place concrete around posts and vibrate or tamp for consolidation. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.



2. Embedded Items: Follow equipment KOMPAN's and Landscape Structures' written instructions and drawings to ensure correct installation of anchorages for equipment.
3. Finishing Footings: Smooth top, and shape to shed water.

### 3.3 FIELD QUALITY CONTROL

- A. Testing Agency: CSPI-certified KOMPAN representative, CSPI-certified Landscape Structures representative, or another qualified testing agency to perform tests and inspections.
- B. Perform the following tests and inspections:
  1. Perform inspection and testing for each type of installed playground and fitness equipment according to ASTM F1487.
- C. Playground and fitness equipment items will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.
- E. Notify Landscape Architect forty-eight (48) hours in advance of date(s) and time(s) of testing and inspection.

END OF SECTION 116800

## SECTION 12 2400 WINDOW SHADES

### PART 1 - GENERAL

- 1.01 Applicable provisions of Bidding Requirements, Contract Requirements in Division 0 and all applicable Division 1 sections.
- 1.02 SECTION INCLUDES
- A. Manual 3% open roller shades and accessories typical for windows in the Offices and other rooms as indicated on drawings; refer to window schedule.
  - B. Manual black out roller shades and accessories typical for windows in indicated rooms indicated as Assembly; refer to window schedule.
  - C. Refer to room finish / window schedule for final product selection.
- 1.03 RELATED REQUIREMENTS
- A. Section 061000 - Rough Carpentry: Concealed wood blocking for attachment of shade brackets and accessories.
- 1.04 REFERENCE STANDARDS
- A. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.
  - B. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2015.
  - C. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.
  - D. WCMA A100.1 - Safety of Window Covering Products; 2018.
- 1.05 ADMINISTRATIVE REQUIREMENTS
- A. Coordination:
    - 1. Coordinate the work with other trades to provide rough-in of electrical wiring as required for installation of hardwired motorized shades.
  - B. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of all affected installers.
  - C. Sequencing:
    - 1. Do not fabricate shades until field dimensions for each opening have been taken with finished conditions in place. "Hold to" dimensions are not acceptable.
    - 2. Do not install shades until final surface finishes and painting are complete.
- 1.06 SUBMITTALS
- A. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product to be used including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

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WINDOW SHADES

- B. Shop Drawings: Include shade schedule indicating size, location and keys to details.
- C. Source Quality Control Submittals: Provide test reports indicating compliance with specified fabric properties.
- D. Selection Samples: Include fabric samples in full range of available colors and patterns.
- E. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.
- F. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.
- G. Operation and Maintenance Data: List of all components with part numbers, and operation and maintenance instructions; include copy of shop drawings.
- H. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

#### 1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of this type with minimum ten years of documented experience with shading systems of similar size, type, and complexity; manufacturer's authorized representative.

#### 1.08 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

#### 1.09 WARRANTY

- A. Provide manufacturer's standard, non-depreciating warranty, for interior shading only, covering the following:
  1. Shade Hardware: 10 years unless otherwise indicated.
  2. Shade Fabric: 10 years unless otherwise indicated.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Basis of Design: Draper (draperinc.com)
  1. Acceptable Manufacturer: Draper Inc., which is located at: 411 S. Pearl Street P. O. Box 425; Spiceland, IN 47385-0425; Toll Free Tel: 800-238-7999; Tel: 765-987-7999; Fax: 866-637-5611; Local Contact: Chris Sitarov – Regional Sales Manager; Tel: 609-437-7763; Email: chris.sitarov@draperinc.com); Web: <http://www.draperinc.com>
- B. Acceptable Basis of Design: MechoShade Systems LLC; [www.mechoshade.com/#sle](http://www.mechoshade.com/#sle).
- C. Or Approved Equal

## 2.02 ROLLER SHADES

- A. General:
  - 1. Provide shade system components that are capable of being removed or adjusted without removing mounted shade brackets or cassette support channel.
  - 2. Provide shade system that operates smoothly when shades are raised or lowered.
- B. Roller Shades - Basis of Design: Draper Or MechoShade Systems LLC; Mecho/5 System; [www.mechoshade.com](http://www.mechoshade.com)
  - 1. Operation: Bead chain and clutch operating mechanism allowing shade to stop when chain is released. Designed never to need adjustment or lubrication. Provide limit stops to prevent shade from being raised or lowered too far.
    - a. Spring-Assist Clutch: Adjustment-free system includes spring-assist components to reduce lifting forces required to raise the shade. Manufacturer shall provide estimated torque for shade unit. Spring-assist is recommended on estimated non-spring-assist torque above 6 lb-in; required on shades with an estimated torque higher than 15 lb-in.
    - b. Bead chain loop: Stainless steel bead chain.
    - c. Bead Chain Hold Down: Spring-Loaded Tensioner complying with ANSI/WCMA A100.1-2018 safety standard.
    - d. Idler end: Height adjustable idler end allows fine leveling adjustments after installation-min plus or minus 1/8 inch without shimming brackets. Contains at least two entry points for the idler end. Safety engagement feature requires idler end pin to have a minimum engagement in bracket, ensuring that the idler end cannot fall out of the bracket due to lack of pin engagement.
  - 2. Single Roller Configuration:
    - a. Mounting: Endcaps and fascia.
    - b. Fascia: L shaped aluminum extrusion to conceal shade roller and hardware.
      - 1) Attachment: Snaps onto endcaps without requiring exposed fasteners of any kind. Fascia can be mounted continuously across two or more shade bands. Notching of fascia to provide for chain clearance is NOT acceptable. Fascia height to match throughout space unless specifically approved in advance by the Architect
      - 2) Selected from Manufacturers standard range.
    - c. Roller Tube: Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Minimum roller diameter 1.5 inches. Tube diameters less than 1.5 inches shall not be acceptable unless manufacturer provides deflection analysis showing deflection limited to  $\leq \text{width (inches)} / 700$  at 1.5X design load.
      - 1) Fabric to tube attachments: Spline fabric/roller attachment system to allow shade fabric to be removed from roller without having to remove roller from brackets.
    - d. Shade slat:
      - 1) Closed pocket elliptical slat: 1 inch (25 mm) aluminum elliptical slat inside of a 1-5/8 inch (41 mm) pocket with heat sealed ends.
  - 3. Rollers: Extruded aluminum roller tube of appropriate diameter to support shade fabric with minimal deflection.
    - a. Minimum Roller Tube Diameter: 1.5 inches (32 mm). Tube diameters less than 1.5 inches shall not be acceptable unless manufacturer provides deflection analysis showing deflection limited to  $\leq \text{width (inches)} / 700$  at 1.5X design load.
    - b. Fabric Connection to Roller Tube: Spline fabric/roller attachment system to allow shade fabric to be removed from roller without having to remove roller from

- brackets.
    - c. Fabric Length: 6 inches (152 mm) greater than window height minimum.
    - d. Hembar: Extruded aluminum, finished to match fascia.
  - 4. Description: Single roller, manually operated fabric window shades.
    - a. Drop Position: Regular roll.
    - b. Mounting: Above ceiling at all location but the Watch, which is to be mounted between jambs at the ceiling.
    - c. Size: To fit above ceiling as indicated on the Reflected Ceiling Drawings. Contractor to field verify dimensions and include on shop drawings for approval, prior to fabrication..
    - d. Fabric: Refer to Paragraph 2.03 below.
- C. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
  - 1. Material: Steel, 1/8 inch thick.
- D. Roller Tubes:
  - 1. Material: Extruded aluminum.
  - 2. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
  - 3. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
  - 4. Roller tubes to be capable of being removed and reinstalled without affecting roller shade limit adjustments.
  - 5. Hembars: Designed to maintain bottom of shade straight and flat.
    - a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
    - b. Room-Darkening Shades: Provide a slot in bottom bar with wool-pile light seal.
- E. Clutch Operator: Manufacturer's standard material and design integrated with bracket/brake assembly.
  - 1. Provide a permanently lubricated brake assembly mounted on a oil-impregnated hub with wrapped spring clutch.
  - 2. Brake must withstand minimum pull force of 50 pounds in the stopped position.
  - 3. Mount clutch/brake assembly on the support brackets, fully independent of the roller tube components.
  - 4. Drive Chain: Continuous loop stainless steel beaded ball chain, 95 pound minimum breaking strength. Provide upper and lower limit stops.
    - a. Chain Retainer: Chain tensioning device complying with WCMA A100.1.
  - 5. Managed Lift: Required lifting force of 3 pounds to a maximum of 8.5 pounds for single band or multi-band shades up to 5 bands and a maximum of 30 pounds hanging weight.
- F. Accessories:
  - 1. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners; clear anodized finish.
    - a. Fascia to be capable of installation across two or more shade bands in one piece.
    - b. Provide single fascia to accommodate regular roll shades.
    - c. Provide front and rear double fascia.
    - d. Color: White.
    - e. Configuration: Captured, fascia stops at captured bracket end.
  - 2. Room-Darkening Channels, Standard: Extruded aluminum side and center channels with brush pile edge seals, SnapLoc mounting base, and concealed fasteners. Channels to accept one-piece exposed blackout hembar to assure side light control and sill light control. Required. Refer to Drawings.

3. Accessories for above ACT ceiling mounting in Day Room, Bunk Room and Officer's Room.

## 2.03 SHADE FABRIC

- A. Fabric - Type 3% Open: Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
  1. Material Certificates and Product Disclosures:
    - a. Low-Emitting Material Certification: Greenguard Gold certified and listed in UL (GGG).
    - b. Cradle to Cradle Material Health Certificate: Achievement level of Bronze.
    - c. Health Product Declaration (HPD): Complete, published declaration with full disclosure of known hazards.
  2. Performance Requirements:
    - a. Flammability: Pass NFPA 701 large or small scale test.
  3. Openness Factor: 3%, nominal.
  4. Maximum Roll Width: 63 inches.
  5. Basis of Design Color: Oyster /Pearl Grey by Draper
  6. Fabrication:
    - a. Fabric Orientation: Railroaded, fabric is turned 90 degrees off the roll.
  7. Products:
    - a. Basis of Design: Draper SW2400 (2410); SW2430 3% Oyster /Pearl Grey
    - b. Light-Filtering Fabrics; PVC Coated Fiberglass; Basketweave
    - c. SheerWeave Series SW2400 (2410) by Phifer: 500 denier fiberglass, vinyl coated and woven into a 2 x 2 basket weave. Fire rating: California U.S. Title 19 (small scale), NFPA 701 TM#1 (small scale), NFPA 101 (Class A Rating), IBC Section 803.1.1 (Class A Rating), BS 5867 Part 2 Type B Performance, NFPA 701 TM#2 (large scale), CAN/ULC-S 109 (large and small scale), CAN/CGSB2-4.162-M80. Bacteria and fungal resistance: ASTM E 2180, ASTM G21, ASTM G 22, AATCC30 Part 3, ASTM D 3273, UL GREENGUARD Mold and Bacteria Standard ASTM 6329; includes Microban antimicrobial additives. Environmental certification: Certified to UL GREENGUARD and GREENGUARD Gold standards for low chemical emissions into indoor air during product usage. Safe use: RoHS/Directive 2002/95/EC, US Consumer Product Safety Commission Section 101 and ANSI/WCMA A 100.1-2007 for lead content and REACH (EC 1907/2006) compliant. 3 percent open .019 inches thick. 14.1 oz/square yard.
- B. Fabric: - Type Blackout, Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.
  1. Material Certificates and Product Disclosures:
    - a. Low-Emitting Material Certification: Greenguard Gold certified and listed in UL (GGG).
    - b. Cradle to Cradle Material Health Certificate: Achievement level of Bronze.
    - c. Health Product Declaration (HPD): Complete, published declaration with full disclosure of known hazards.
  2. Performance Requirements:
    - a. Flammability: Pass NFPA 701 large or small scale test.
  3. Openness Factor: opaque, nominal.
  4. Maximum Roll Width: 126 inches.
  5. Basis of Design Color: Verona Twilight 000STA Stardust by Draper.
  6. Fabrication:
    - a. Fabric Orientation: Railroaded, fabric is turned 90 degrees off the roll.
    - b. Or as selected and Approved
  7. Products:

- a. Draper; Blackout - Verona Twilight 000STA Stardust (opaque)
- b. Room Darkening Fabrics; Opaque; Polyester
- c. Verona Twilight by Mermet. 50 percent Polyester and 50 percent acrylic with foam backing. Duraguard fabric protector and Sanitized Antimicrobial Protection. Plain weave that is 100% PVC free. Fire rating: NFPA 701-10 TM#1, California U.S. Title 19, CAN/ULC-S109-03 Small & Large Flame Test. Environmental Benefits: Certified to UL GREENGUARD and GREENGUARD Gold standards for low chemical emissions into indoor air during product usage. RoHS compliant - lead free. Bacterial and fungal resistance: ASTM E2180. 0% open, .024 inches thick, 11.65 oz/square yard.

## 2.04 ROLLER SHADE FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
  - 1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window stool.
  - 2. Horizontal Dimensions - Inside Mounting: Provide symmetrical light gaps on both sides of shade not to exceed 3/4 inch total.
- C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Examine finished openings for deficiencies that may preclude satisfactory installation.
- B. Start of installation shall be considered acceptance of substrates.

### 3.02 PREPARATION

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

### 3.03 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.
- C. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

### 3.04 CLEANING

- A. Clean soiled shades and exposed components as recommended by manufacturer.
- B. Replace shades that cannot be cleaned to "like new" condition.

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WINDOW SHADES

- C. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.

3.05 PROTECTION

- A. Protect installed products from subsequent construction operations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 12 24 00 12 2400



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## SECTION 12 3600 SOLID SURFACE COUNTERTOPS

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.02 REFERENCES

- A. ASTM International
  1. ASTM D 6110; Standard Test Method for Determining the Charpy Impact Resistance of Notched Specimens of Plastics ASTM D 570; Standard Test Method for Water Absorption of Plastics.
  2. ASTM D 790; Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
  3. ASTM D 696; Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer.
  4. ASTM D 2583; Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
  5. National Electrical Manufacturers Association (NEMA) LD.3 High Pressure Decorative Laminates.

#### 1.03 SUBMITTALS

- A. Refer to Section 01 3300 "Submittal Procedures"
- B. Product Data: Submit manufacturer's current product literature for each product indicated.
- C. Samples: Provide a four-inch square color sample for products indicated.
- D. Shop Drawings: Include details, and attachments to other work.
  1. Submit Shop drawings showing seams, termination points, and details of edges.
  2. Submit coordination drawings indicating electrical and plumbing work.
- E. Manufacturer Instructions: Provide manufacturer's written installation instructions.
- F. Installer Certification: Submit a signed copy of the installer's certificate, acknowledging the employee has been trained and approved by the manufacturer'

#### 1.04 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer approved installer shall fabricate and install solid surface products, and demonstrate successful experience in installing finished carpentry items similar in type and quality to those required for this project.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Refer to Section 01 6000 "Product Requirements".

- B. Deliver sheets, fabricated items, materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store solid surface products and accessories as recommended by manufacturer.

## PART 2 PRODUCTS

### 2.01 MANUFACTURER

- A. Avonite Surfaces Acrylic Solid Surface sheets are manufactured by Aristech Surfaces LLC, 7350 Empire Drive Florence, KY 41042, USA; Phone 1.800.354.9858 or 859.283.1501, fax 859.283.7378; website [www.aristechsurfaces.com](http://www.aristechsurfaces.com).

### 2.02 SOLID SURFACE MATERIAL

- A. Basis of Design: Avonite Surfaces® Acrylic by Aristech Surfaces, LLC.
- B. Description: Non-porous, homogeneous material maintaining the same composition throughout the product with a composition of polyester or acrylic polymer, aluminum trihydrate filler and pigment.
- C. Thickness: 12mm.
- D. Color: Gloss K3-8344 Charcoal Pearl
- E. Sheet Size: Avonite Surfaces® Acrylic standard 30" x 144".
- F. Performance Characteristics based on 12mm thick solid color: Avonite Surfaces® Acrylic:
  1. Specific Gravity: 28.3 grams/cu. in.
  2. Hardness: 59, when tested in accordance with ASTM D2583.
  3. Flexural strength: 8,000 psi, when tested in accordance with ASTM D790.
  4. Tensile Modulus: 12.3 x 10<sup>5</sup>, when tested in accordance with ASTM D790.
  5. Water Absorption after 24 hours: 0.04 %, when tested in accordance with ASTM D570.
  6. Charpy Impact Foot Pounds per Inch: 1.5, when tested in accordance with ASTM D6110.
  7. Impact Resistance 1/2 Pound: No Fracture at a height >150 in, when tested in accordance with NEMA LD3-3.3.
  8. Linear Thermal Expansion, in/in/oF: 2.1 x 10<sup>-5</sup>, when tested in accordance with ASTM D696.
  9. High Temperature Resistance: No Effect, when tested in accordance with NEMA LD3-3.6.
  10. Boiling Water Resistance: No Effect, when tested in accordance with NEMA LD3-3.5.
  11. Stain Resistance: No Effect, when tested in accordance with NEMA LD3-3.9.
  12. Weight per sq. ft., 12mm thickness: 4.5 pounds.

### 2.03 ACCESSORIES

- A. Silicone Sealant: Mildew-resistant, FDA-compliant, 100% silicone sealant recommended by manufacturer
- B. Sink: drop-in refer to plumbing drawings / TBD.

## 2.04 FABRICATION

- A. Solid surface shall be finished and fabricated by an Aristech Surfaces LLC authorized fabricator.
- B. Product is supplied unfinished; specify and communicate desired finish to fabricator.
- C. Fabricate using 12mm thick material unless otherwise indicated.
- D. Solid surface shall be fabricated to field measurements.
- E. Cut and finish component edges with clean, sharp returns.
- F. Finished edges shall have a 1/16-inch radius.
- G. Cutouts for sinks and other accessories shall be smooth and uniform without saw marks. The top and bottom of openings shall be finished smooth.
- H. Maintain minimum ¼ inch (6mm) radius for sink cutouts.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Inspect materials and location of installation for conditions affecting performance of work in accordance with shop drawings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

- A. Install solid surfaces in accordance with manufacturer's installation guidelines and recommendations.
- B. Field cut countertop as required for plumbing fixtures and bath accessories.
- C. Cure countertops for 24 hours, minimum, before exposure to moisture or pressure.
- D. Corner joints: Form 1/8-inch-wide joints, sealed with manufacturer's color-matching silicone sealant.
- E. Back splashes: Field install with tight, sealed joints.
- F. Field joints shall be hard seamed unless otherwise specified.
- G. Attach solid surfaces material to leveled supports on frame with dabs of silicone every 18"-24".
- H. Fasten solid surface material to frame by anchoring screws to supports at all corner blocks. Screws should not come in contact with solid surface material, as this may cause cracking of countertop.

### 3.03 CLEANING AND PROTECTION

- A. Remove adhesives, sealants and other stains.

- B. Protect installed wall cladding from damage. Repair or replace damaged work, to Architects satisfaction.

END OF SECTION 12 3600

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

- A. Section Includes:
  - 1. Soccer goals
  - 2. Football goals
  - 3. Football goalpost pads
  - 4. Ball Control Netting
  - 5. Team Benches

### 1.3 ACTION SUBMITTALS

- A. Product Data: Manufacturer's standard product literature for each type of product, including shop drawings, installation instructions, and maintenance instructions.
- B. Samples: For each exposed product and for each color and texture specified.
- C. Product Schedule: For site furnishings. Use same designations indicated on Drawings.

### 1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For site furnishings.

### 1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For site furnishings to include in maintenance manuals.

## PART 2 - PRODUCTS

### 2.1 SOCCER/FOOTBALL GOALS

- A. Rollaway Combination Goal, Model # **RCG-HS** (8' ht. x 24' w. soccer goal, 11'-3" x 23'-4" w. inside dimension football goal)
- B. Posts: Aluminum Goal Frame and Backstays, Powder Coat White (Soccer) and Yellow (Football) Finish, with Pneumatic Wheels

Issue for Bid

- C. Net: 3mm, 3-1/2" mesh, white net
- D. Hardware: All stainless steel, galvanized and brass hardware
- E. Quantity: Two (2)
- F. As manufactured by one of the following:
  - 1. Aluminum Athletic Equipment  
1000 Enterprise Drive  
Royersford, PA 19468  
aaesports.com
- G. Soccer goal pads shall be Premium 72" ht. foam encased in double-knife coated vinyl pads in color yellow. Model number SG-PAD as manufactured by Aluminum Athletic Equipment. Quantity: Two (2).

2.2 LACROSSE GOALS

- A. Official Lacrosse Goal, Model # LG
- B. Posts: 1.90" diameter structural aluminum extrusion, welded into one piece. Goal mouth to be powder coated orange.
- C. Hardware: All stainless steel, galvanized and brass hardware
- D. Quantity: Two (2)
- E. As manufactured by one of the following:
  - 1. Aluminum Athletic Equipment  
1000 Enterprise Drive  
Royersford, PA 19468  
aaesports.com  
  
Quantity: Two (2)

2.3 BALL CONTROL NETTING SYSTEM

- A. 40' Model # **MBS-40** (40' high system, straight post):
- B. Posts: Straight Post 8"O.D. x .188" wall x 45'-8"lg., 40'-8" out of ground, 6061T6 aluminum extrusion with pre-drilled holes for mounting hardware, 8.625" O.D. x .148" wall x 78"lg. 6061T6 aluminum ground sleeve with a stop-bolt at 60". Typical spacing between posts 20' maximum. Provide heavy duty sleeve caps.

Issue for Bid

- C. Net: 40' high, #AAE420, 1-1/2"sq. (45mm) black UV-treated HTTP knotless net, 360# tensile strength, 1/4" MFP rope border all 4 sides, pre-attached sewn in 3/16"dia. galvanized clear coated cable.
- D. Hardware: All stainless steel, galvanized and brass hardware, pulley system for raising/lowering net, 5/16" braided rope with pre-attached hardware, a cleat for rope tie-off, and a clamp with snap at bottom of post to secure net.
- E. Recommended Footing Specification: 36" diameter x 84" depth, bell bottom of hole, 6" compacted crushed stone at bottom, 4,000lbs. mix concrete. Installation by contractor, consult local codes.
- F. As manufactured by:
  - 1. Aluminum Athletic Equipment  
1000 Enterprise Drive  
Royersford, PA 19468  
aaesports.com

2.4 SOCCER CORNER FLAGS

- A. Premium Corner Flags, Model Number SCF60
- B. As manufactured by:
  - 1. Aluminum Athletic Equipment  
1000 Enterprise Drive  
Royersford, PA 19468  
aaesports.com

C. Quantity: One set (4 flags)

2.5 TEAM BENCHES

- A. Model # 105 (8' long, backless)
- B. Seat: four (4) 4"x4" nominal slats, 8' long, kiln-dried Douglas fir
- C. Supports: 2-7/8" o.d. steel pipe, galvanized, painted color: black. post embedded in concrete footing
- D. Hardware: all stainless steel, galvanized hardware
- E. Recommended footing specifications: 36" deep x 12" dia.
- F. As manufactured by:
  - 1. DuMor Site Furnishings  
dumor.com

Quantity: Eight (8)



2.6 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.
- B. Verify that substrates are stable and capable of supporting the weight of items covered under this section.
- C. Verify the substrates have been adequately prepared to securely anchor those items that will be surface mounted.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

2.7 INSTALLATION, GENERAL

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.
- C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.
- D. It is the responsibility of the installer to ensure that all base materials into which the furnishings will be installed can support the rack and will not be damaged by any required installation procedures.

END OF SECTION 12 93 00

## SECTION 133423 FABRICATED STRUCTURES

### Part 1 – GENERAL

#### 1.01 SUMMARY

Contractor to furnish transportable precast concrete building components. Building to be delivered and placed on Owner's prepared foundation in accordance with Manufacturer's recommendations. Precast building to be EASI-SET™ Model 1214 as manufactured by M&W PRECAST LLC – Ottsville, PA (610-847-1423). Building is to be provided by Manufacturer with all necessary openings as specified by Contractor in conformance with Manufacturer's structural requirements.

#### 1.02 REFERENCES

A. American Society for Testing and Materials

1. ASTM A185; Standard Specification for Steel Welded Wire Reinforcement, Plain for Concrete
2. ASTM A615; Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

B. American National Standards Institute (ANSI):

1. ANSI A115.1; Preparation for Mortise Locks for 1-3/4" Doors
2. ANSI A156.1; Butts and Hinges
3. ANSIA156.13; Mortise Locks and Latches Series 1000

C. BOCA, Building Officials & Code Administrators International, Inc.

D. ACI-318-02, "Building Code Requirements for Reinforced Concrete".

E. Concrete Reinforcing Institute, "Manual of Standard Practice".

F. ANSI/ASCE-7-2 "Building Code Requirements for Minimum Design Loads in Buildings and Other Structures".

G. International Building Code (IBC) - 2015

H. UL-752 test method level 4 for bullet resistance certified by an independent structural engineer.

#### 1.03 SYSTEM DESCRIPTION

## Issue for Bid

- A. Design Requirements: Provide a building designed in accordance with ACI-318 and local prevailing building codes for reinforced concrete and manufactured under Prestressed Concrete Institute (PCI) standards and Quality Control Manual MNL-116.
- B. Dimensions:
  - 1. Exterior: 14'-0" x 20'-0" x 11'-3" high
  - 2. Interior: 13'-8" x 19'-4" x 8'-0" minimum ceiling height
- C. Design Loads:
  - 1. Seismic Load Performance Category 'C', Exposure Group III
  - 2. Standard Live Roof Load – 60 psf
  - 3. Standard Floor Load – 250 psf
  - 4. Standard Wind Loading – 130 mph
- D. Gabled Concrete Roof: Roof panels shall slope from approximately 33" above center of long-sided direction toward left and right long-sided walls. Exterior surface to be cast with smooth steel trowel finish. The roof shall extend a minimum of 2'-½" beyond the vertical wall panel on each side and have a turndown design which extends ½" below the top edge of the wall panels to prevent water migration into the building along the top of wall panels. Roof shall also have a smooth edge.
- E. Roof, floor and walls panels must each be produced as single component monolithic panels. No roof, floor or vertical wall joints will be allowed, except at corners. Wall panels shall set on top of floor panel.
- F. Floor panel must have ½" step-down around the entire perimeter to prevent water migration into the building along the bottom of wall panels.

### 1.04 QUALITY ASSURANCE

- A. Manufacturer must be producer member of the National Precast Concrete Association (NPCA) and participate in its Plant Certification Program.
- B. Manufacturer Qualifications: A manufacturer who has experience in the fabrication of pre-engineered manufactured buildings for a period of 5 years minimum.
- C. No alternate building designs to the pre-engineered EASI-SET building will be allowed unless pre-approved by the owner ten (10) days prior to bid date.

### 1.05 SUBMITTALS

- A. Building engineering calculations that are designed and sealed by a State licensed Professional Engineer in which the building will be installed, shall be submitted for approval.

## Part 2 – PRODUCTS

### 2.01 MATERIALS

- A. Concrete: Steel-reinforced, 5000 psi minimum 28-day compressive strength, air-entrained (ASTM-C260)
- B. Reinforcing Steel: ASTM A615, grade 60 unless otherwise indicated.
- C. Post-tensioning Strand: 41K Polystrand CP50, .50, 270ksi, 7-wire strand, enclosed within a greased plastic sheath, (ASTM A416). Roof and floor each to be post-tensioned by a single, continuous tendon. Said tendon shall form a substantially rectangular configuration having gently curving corners wherein the positioning of the cable member results in a pattern of one or more loops and a bisecting of the loop(s). The cable member starts from one corner of the concrete building panel, forms a gentle perimeter loop(s) returning to a point where the cable member entered the concrete building panel. The tendon then turns 90 degrees and follows the cable member(s) to a point midway along the "Y" axis of the concrete building panel and then turns 90 degrees along the "X" axis of the concrete building panel. This bisects the concrete building panel and crosses the opposite parallel portion of the cable member and exits from an adjacent side of the concrete building panel.
  - 1. If post-tensioning is not used in the roof panel, the following guidelines must be followed to ensure a watertight roof design.
    - a. The entire precast concrete roof panel surface must be cleaned and primed with a material that prepares the concrete surface for proper adherence to the coating material.
    - b. The entire precast concrete roof panel surface shall be sealed with a .045 EPDM continuous membrane cemented to the concrete with a compound designed for this purpose.
- D. Caulking: All joints between panels shall be caulked on the exterior and interior surface of the joints. Caulking shall be SIKAFLEX-1A elastic sealant for exterior joints. SIKAFLEX-15LM elastic sealant for interior joints.
- E. Panel Connections: All panels shall be securely fastened together with 3/8" thick steel brackets. Steel is to be of structural quality, hot-rolled carbon complying with ASTM A283, Grade C and powder coated after fabrication. All fasteners to be 1/2" diameter bolts complying with ASTM A307 for low-carbon steel bolts. Cast-in anchors used for panel connections to be Meadow-Burke #FX-19, or equal. All inserts for corner connections must be fastened directly to form before casting panels. No-floating-in of connection inserts shall be allowed.

## 2.02 ACCESSORIES

- A. Doors and Frames: Shall comply with Steel Door Institute "Recommended Specifications for Standard Steel Doors and Frames" (SDI-100) and as herein specified. The building shall be equipped with one (1) double set 3'-0" x 7'-0" x 1 3/4", 18 gauge galvanized active metal doors with 16 gauge galvanized frame. Doors and frame shall be bonderized and painted one coat of rust inhibitive primer and one finish coat of enamel paint, Owner to select standard available color.
- B. Door Hardware:

## Issue for Bid

1. Hinges: McKinney TA2314 4-1/2" x 4-1/2" NRP (non-removable pin) x 32D, 3 per door, or equal
2. Lock Set: Schlage B660P6 x 12-296 x 10-087 x 626 Heavy Duty Commercial Grade Cylinder Deadbolt, or equal
3. Pull Plate: Rockwood 107 x 70C x Type 1 x US32D, or equal
4. Push Plate: Rockwood 70C-RKW x US32D, or equal
5. Door Holder: Rixson 9-326 x 630, or equal (inactive door)
6. Door Closer: Norton 8501 x 689, or equal (Restrooms)
7. Threshold: Pemko 171A x 72"w x A, or equal
8. Drip Cap: Pemko 346C x 76"w x C, or equal
9. Door Sweep: Pemko 315CN x 36"w x C, or equal
10. Surface Bolts: Rockwood 580-8 x US26D, or equal
11. Astragal: Pemko 357C84 x C, or equal

## 2.03 PLUMBING

- A. The following fixture shall be wall mounted with piping through the wall into the building interior. A penetration will be provided in the building floor for entrance of plumbing utilities. The fixtures shall be as follows:

1 – Woodford B26-1/2- RB Mild Climate recessed hose bib with locking cover, or equal

## 2.04 ELECTRICAL

- A. All equipment and conduit shall be surfaced mounted. The load center will be located in an area designated by Owner. All branch conduit and wiring shall be run to the load center. The connection of electrical utilities to the load center is by others. A penetration will be provided for entrance of electrical utilities into the building interior. The electrical components shall be as follows:

1 – Square-D Q0140M100 load center single phase, 100-amp, 120/240 volt, or equal  
4 – Columbia Lighting LAW4-40ML-EDU 4' non-vandal resistant light fixture, or equal  
4 – Raab Lighting Slim 12/PC Exterior light with photocell, or equal  
1 – Leviton 1221-21 Single Pole Switch, or equal  
3 – Leviton GFNT2-I 15-amp GFCI Receptacle, or equal

## 2.05 FINISHES

- A. Interior of Building: Smooth steel trowel finish on all interior panel surfaces. The interior surfaces shall remain natural color concrete.
- B. Exterior of Building: Smooth steel form finish on all exterior panel surfaces. The exterior surfaces shall remain natural color concrete.
- C. Floor finish: Smooth steel form finish. The surface shall remain natural color concrete.

## PART 3 – EXECUTION

### 3.01 SITE PREPARATION (Standard Preassembled Building)

- A. Foundation shall be designed in accordance with local building code and soil conditions. The building shall bear fully on firm undisturbed soils with an approved fill or pad. The EASI-SET™ Building shall at a minimum bear fully on a crushed stone base that is at least two feet larger than the length and width of building
- B. Stone shall be a minimum of 8" thick down to firm subgrade. The vertical soil capacity under stone shall be compacted to have minimum bearing of 1,500 pounds per square foot. Stone shall be  $\frac{3}{4}$ " clean or smaller, and topped with 2" of sand or screenings; and must be screed level within  $\frac{1}{4}$ " in both directions. Stone shall be placed within a perimeter form with flat and level top edge for screeding. Forming material shall remain around stone until after the building is set.
- C. The crushed stone base shall be kept within the confines of the soil or perimeter form. Do not allow the base to become unconfined so that it may wash, erode or otherwise be undermined.
- D. Or if the building is placed on pavement or a concrete slab, substrate below pavement or slab must have a vertical soil capacity of 1,500 pounds per square foot. Place stone or sand to 1" above highest point of area where building will be placed and at least 1'-0" wide all-around building footprint. Retain stone or sand with a perimeter form to prevent the material from washing out.
- E. No building shall bear directly on rock. Where rock is closer than 2 feet from the bottom of the building floor slab or foundation slab, it shall be undercut to a minimum of 2 feet below the building and replaced with approved fill material.
- F. Provide positive drainage for the fill, pad, or slab as required.
- G. A vapor barrier of 6 mil polyethylene shall be placed between the fill, pad, or foundation slab, and the floor slab where moist conditions exist.

### 3.02 ACCESS

- A. Contractor to provide level unobstructed area large enough for crane and tractor-trailer to park adjacent to pad. Crane must be able to place outriggers within 3'-0" of edge of pad and truck and crane must be able to get side-by-side under their own power. No overhead lines may be within 75' radius of center of pad. Firm roadbed with turns that allow 65' low-bed tractor and trailer access must be provided directly to site. No building shall be placed closer than 2'-0" to an existing structure.

END OF SECTION 321313

## SECTION 14 2400 HYDRAULIC ELEVATORS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Complete hydraulic elevator system.
  - 1. Passenger type.
  - 2. Oil Hydraulic Dual Jack Holeless Single-Stage Passenger type as shown on drawings.
  - 3. Doors on each of three levels.
  - 4. Special provisions for operation sequence.
  - 5. Additional, Performance, PA Elevator Code and ADA Compliance Requirements.
- B. Elevator Maintenance Contract.
- C. Summary of work included: Furnish all materials, labor, equipment and services required for the complete installation of the oil hydraulic passenger elevator as specified herein. The work of this division shall consist of installation of items that will meet Barrier Free Design Guidelines and compliance with the Americans with Disabilities Act on the hydraulic passenger elevator located in Philadelphia. The work shall include all labor, materials, and services required for the complete installation of all the elevator equipment as herein specified. The work shall provide on a per item basis, including car operating panel, hall push buttons, pump, controller, door operator, traveling lanterns, etc.
- D. Summary of work required in other sections to be provided, support and to be confirmed designed and installed correctly under this section:
  - 1. A clear hoistway of the dimensions shown, plumb to within 1" in Section 042000.
  - 2. Venting of hoistway as required by code.
  - 3. A dry pit, reinforced to sustain vertical loads as required.
  - 4. A steel pit ladder for each elevator and installed in accordance with code, and extending from pit floor to 48" above sill of lowest hoistway door; in Section 055133.
  - 5. Adequate supports for guide rail brackets, to support horizontal loads as required. Support locations must not exceed spacing as required by code, and shop drawings for which are to be review and approved by elevator manufacturer and installer. Guide rail support locations must be filled concrete block with reinforcements; in Section 042000.
  - 6. Projections or recesses in the hoistway of 4" or more, on sides not used for loading or unloading, shall be beveled at an angle not less than 75 degrees from the horizontal.
  - 7. A hoist beam, hook, or eyebolt shall be furnished at the top of the hoistway, located on centerline of car and guides - designed to lift load required; in Section 055000.
  - 8. Entrance walls accepting passenger type entrances are to be erected (or rough opening as shown filled in) after door frames and sills are installed; in Section 042000.
  - 9. A suitable sill support and recess as shown, full width of the hoistway, grouted under CMU section after door sills are installed; in Sections 033000 and 042000.
  - 10. Required sleeves in hoistway wall for oil line and wiring duct for each elevator, as required in MPE sections.
  - 11. Any cutting and patching of building construction required to install signal fixtures, or other elevator apparatus, and any repairs, grouting, patching, or painting made necessary by same.
  - 12. A machine room properly lighted and ventilated per code requirements with temperature maintained between 65 and 95 degrees. Door of size to permit access for hydraulic machine, to be self-closing and locking, but openable from inside without key. See drawings, door schedule and Section 092500 for shaftwall enclosure.

13. A fused disconnect switch for each elevator, of ample capacity, with wiring to the elevator motor starter control. Disconnecting means shall disconnect the normal power supply as well as emergency supply, when provided.
14. Light and switch in elevator room, with switch located adjacent to access door. Convenience outlet in machine room.
15. Light, switch and convenience outlet in elevator pit, light switch accessible from lower landing opening. Install light to clear elevator car.
16. Suitable 110V service connected to terminals in elevator controller for car light service (elevator contractors option).
17. Heat, and product of combustion sensors located in each elevator lobby with necessary wiring to elevator control panel, when fire service is specified.
18. Telephone instrument in elevator car, and wiring from building source to elevator control panel.
19. Furnishing of any special intercom, paging, or television systems, including wiring from building source to elevator control panel.
20. Floor covering in elevator cab; in Section 093000.

#### 1.02 RELATED REQUIREMENTS

- A. Section 03 3000 - Cast-in-Place Concrete: Includes elevator machine foundation, enclosed hoistway, elevator pit, grouting thresholds, grouting hoistway entrance frames, and sump pit.
- B. Section 04 2000 - Unit Masonry: Masonry hoistway enclosure; building-in and grouting hoistway door frames.
- C. Section 05 5000 - Metal Fabrications: Includes elevator pit ladder, sill supports, and overhead hoist beams.
- D. Section 07 1300: Waterproofing of elevator pit walls and floor.
- E. Section 07 8100 - Applied Fire Protection: Fireproofing of guide rail brackets where attached to building structural members.
- F. Section 07 8400 - Firestopping: Fire rated sealant in hoistway.
- G. Section 08 3100 - Access Doors and Panels: Fire rated access doors into hoistway.
- H. Section 09 2116 - Gypsum Board Assemblies: Gypsum shaft wall enclosure of machine room and top of shaft as shown on drawings.
- I. Section 09 6500 - Resilient Flooring: Floor finish in car as indicated on drawings.
- J. Section 09 9123 - Interior Painting: Field painting of hoistway entrance doors and frames.
- K. Section 21 1300 - Fire-Suppression Sprinkler Systems: Sprinkler heads in hoistway.
- L. Section 22 3000 - Plumbing Equipment: Pit drain.
- M. Section 26 0533.13 - Conduit for Electrical Systems:
- N. Section 26 0583 - Wiring Connections:
- O. Section 26 3600 - Transfer Switches: For interface with elevator controls.
- P. Section 28 2000 - Video Surveillance: Installation of video camera in car interior for security monitoring.
- Q. Section 31 2316 - Excavation: Excavation for elevator pit.

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- R. Section 31 2323 - Fill: Backfilling for elevator pit.

### 1.03 REFERENCE STANDARDS

- A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2020.
- B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix) 2022.
- C. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- D. AISC 360 - Specification for Structural Steel Buildings 2022.
- E. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- F. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices 2019, with Errata (2021).
- G. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks Includes Inspection Procedures for Electric Traction and Winding Drum Elevators, Hydraulic Elevators, Inclined Elevators, Limited-Use/Limited-Application Elevators, Private Residence Elevators, Escalators, Moving Walks, and Dumbwaiters 2020.
- H. ASME QEI-1 - Standard for the Qualification of Elevator Inspectors 2018.
- I. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- J. ASTM A139/A139M - Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over) 2022.
- K. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes 2017.
- L. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.
- M. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar 2023.
- N. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2021a.
- O. ASTM B36/B36M - Standard Specification for Brass Plate, Sheet, Strip, and Rolled Bar 2018.
- P. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 2021a.
- Q. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2021.
- R. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2021.
- S. ASTM B455/B455M - Standard Specification for Copper-Zinc-Lead Alloy (Leaded-Brass) Extruded Shapes 2020.

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- T. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).
- U. ITS (DIR) - Directory of Listed Products Current Edition.
- V. NEMA LD 3 - High-Pressure Decorative Laminates 2005.
- W. NEMA MG 1 - Motors and Generators 2021.
- X. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- Y. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
- Z. PS 1 - Structural Plywood 2019.
- AA. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.
- BB. UL (DIR) - Online Certifications Directory Current Edition.

#### 1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
  1. Coordinate work with other installers to provide conduits necessary for installation of wiring including but not limited to:
    - a. Elevator equipment devices remote from elevator machine room or hoistway.
    - b. Remote group automatic panel in lobby from controller cabinet.
    - c. Telephone service for machine room.
    - d. Elevator pit for lighting, sump pump, and revisions of final design.
    - e. Automatic transfer switch from controller cabinet.
    - f. Fire alarm panel from controller cabinet.
    - g. Reinforcement of CMU walls for anchors for guiderails.
  2. Coordinate work with other installers for equipment provisions necessary for proper elevator operation, including but not limited to, the following:
    - a. Automatic transfer switches with auxiliary contacts for emergency power transfer status indication.
    - b. Shunt trip devices for automatic disconnection of elevator power prior to fire suppression system activation.
    - c. Overcurrent protection devices selected to achieve required selective coordination.
- B. Preinstallation Meeting: Convene meeting at least one week prior to start of this work.
  1. Review schedule of installation, proper procedures and conditions, and coordination with related work.
- C. Construction Use of Elevator: Not permitted.

#### 1.05 CODES, PERMITS, TESTS AND INSPECTIONS:

- A. Work shall be done in accordance with the requirements of the National Electrical Code and the latest American Standard Safety Code for Elevators, Dumbwaiters and Escalators, including all revisions and authorized changes in effect on date of this specification and all local codes which govern the requirements of this installation.
- B. Provide all necessary State Inspections and permits pertaining to the elevator, elevator installation and functioning, and make such tests as are required by the regulations of such authorities. Tests shall be made in the presence of the authorized representatives of such

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authorities.

- C. Elevators shall meet the guidelines of the Americans with Disabilities Act using the Uniform Federal Accessibility Standards (UFAS) relevant to elevators (Section 4.10 Elevators) as the technical requirements.

#### 1.06 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Shop drawings and sample submittals:
  - 1. Samples: Submit samples of stainless steel.
  - 2. SHOP DRAWINGS: Submit Shop Drawings as required showing the general and detailed arrangement of all elevator equipment. Show ceiling, lighting, signal fixtures, and smoke detectors including routing of exposed conduit.
  - 3. PRODUCT DATA: Submit the manufacturer's specification and data sheets, and standard details. Include pictures, catalog cuts, or other suitable illustrations of all elevator equipment that will be exposed in the finish work, including car, hoistway entrance, and signal and control apparatus.
  - 4. CERTIFICATES: Furnish to the Owner all certificates necessary as evidence that the elevator conforms with the applicable laws, ordinances, and requirements.
- C. Product Data: Submit data on following items:
  - 1. Signal and operating fixtures, operating panels, and indicators.
  - 2. Car design, dimensions, layout, and components.
  - 3. Car and hoistway door and frame details.
  - 4. Electrical characteristics and connection requirements.
- D. Shop Drawings: Include appropriate plans, elevations, sections, diagrams, and details on following items:
  - 1. Elevator Equipment and Machines: Size and location of driving machines, power units, controllers, governors, and other components.
  - 2. Hoistway Components: Size and location of car guide rails, buffers, jack unit and other components.
  - 3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
  - 4. Clearances and over-travel of car.
  - 5. Locations in hoistway and machine room of traveling cables and connections for car lighting, telephone, and other items requiring coordination between trades.
  - 6. Location and sizes of hoistway and car doors and frames.
  - 7. Electrical characteristics and connection requirements.
  - 8. Indicate arrangement of elevator equipment and allow for clear passage of equipment through access openings.
- E. Samples: Submit samples illustrating car interior finishes, car and hoistway door and frame finishes, and cab ceiling finish in the form of cut sheets, finish color selection brochures, or samples.
- F. Manufacturer's Qualification Statement.
- G. Installer's Qualification Statement.
- H. Testing Agency's Qualification Statement.
- I. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

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- J. Initial Maintenance Contract.
- K. Maintenance Contract: Submit proposal to Owner for standard one year continuing maintenance contract agreement in accordance with ASME A17.1 and requirements as indicated, starting on date initial maintenance contract is scheduled to expire.
  - 1. Indicate in proposal the services, obligations, conditions, and terms for agreement period and for renewal options.
- L. Operation and Maintenance Data:
  - 1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
  - 2. Operation and maintenance manual.
  - 3. Schematic drawings of equipment and hydraulic piping, and wiring diagrams of installed electrical equipment with list of corresponding symbols to identify markings on machine room and hoistway apparatus.
- M. Final Submittals
  - 1. Provide four complete sets (bound and properly arranged) of the parts lists and operators manuals prior to receiving final payment. Following is a brief summary of items:
    - a. Legible schematic wiring diagrams including all changes made during installation.
    - b. Description of operation of elevator system installed.
    - c. Pump Package: Including valve and accessories.
    - d. Controller and Selector: Including parts information on Relays, Printed Circuit Boards, Reverse Phase Relays, Switches, Lamps, Electrical Cables, Monitors, Modems, Diagnostic Hardware, Diagnostic Software, and Overload Protection Devices.
    - e. Door Assemblies: Including Hangers, Rollers, Door Motor, Door Operator, Door Clutch Assembly, Door Closers, Door Drive Arms, Related Hardware, Sheaves, Door Guides, Interlocks, Safety Door Edge.
    - f. Signal Equipment: Including Car Station, Hall Stations, Position Indicators, Direction Indicators, Fire Service Panel, Smoke Detectors, Keyswitches, Pushbutton Assemblies.
    - g. Car Top Inspection Station, Limit Switches, Solid State Leveling Control Units, Leveling Switches, Alarm Bell.

#### 1.07 QUALITY ASSURANCE

- A. Maintain one copy of each quality standard document on site.
- B. Designer Qualifications: Design guide rails, brackets, anchors, and machine anchors under direct supervision of a licensed Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- D. Installer Qualifications: Company specializing in performing the work of this section and approved by elevator equipment manufacturer with more than 3 years of experience.
- E. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.
- F. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.

- G. Products Requiring Fire Resistance Rating: Listed and classified by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
- H. Products Requiring Electrical Connection: Listed and classified by UL (DIR) or testing agency acceptable to authorities having jurisdiction as suitable for the purpose indicated in construction documents.

#### 1.08 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Provide manufacturer's warranty for elevator operating equipment and devices for one year from Date of Substantial Completion.
- C. The elevator contractor shall warranty that the materials and workmanship of the apparatus installed by him under this specification are first-class in every respect, and that he will make good any defects not due to ordinary wear and tear or improper use or care, which may develop within one year from date of final payment.

#### 1.09 REQUIREMENTS OF REGULATORY AGENCIES

- A. Perform all work in accordance with applicable codes, the State of Pennsylvania Elevator Code, the National Electrical Code, and the American Society of Mechanical Engineers for Elevators; ASME A17.1, as referenced therein. Give all necessary notices, obtain all State and Municipal permits, pay all fees necessary in connection with the installation, including sales and use taxes as applicable, and make all tests as are called for by the regulations of such authorities. These tests shall be made in the presence of the authorized representative of such authorities and the owner's representative.
- B. Comply with "Elevator Guidelines to Ensure Accessibility by People with Disabilities".

#### 1.10 MAINTENANCE

- A. Provide full protective maintenance of the specified equipment for a period of one year from the date of final turnover. The cost of this maintenance shall be included in the base price. Work should be performed during regular working hours.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Basis of Design – Nonproprietary Hydraulic Elevator: Canton -Nidec Elevator -Dual Jack Holeless; (2000# MRL holeless hydro by Canton Elevator). Bryan.Haught@nidec-canton.com
  - 1. Or Approved Equal Subject to strict Compliance of Requirements.
- B. ACCEPTABLE ELEVATOR INSTALLERS for Basis of Design
  - 1. Kencor Elevator
    - a. P.O. box. 1659
    - b. West chester, PA 19380
    - c. 1-800-220-4046
    - d. and
    - e. 1101 Union Blvd.
    - f. Allentown, PA 18190

- g. and
- h. bkennedy@kencorelevator.com
- 2. Triad Lifts, LLC
  - a. 1608 Walnut St.
  - b. Philadelphia, PA 19103
  - c. 267-462-1011
- 3. Approved Equal Acceptable to Basis of Design

C. OUTLINE OF EQUIPMENT:

- 1. Jack Type: Dual Single-Stage
- 2. Capacity: 2,000 pounds
- 3. Speed: 100 FPM
- 4. Total Travel: 10'-0" to be verified in field
- 5. Stops/Number of Openings: 3 / 3 Front.
- 6. Floors Served: LL, G, 1st
- 7. Platform Size (Width x Depth): 6'-0"W x 5'-9"D
- 8. Door Size/Operation: 3'-0"W x 7'-0" H / Power
- 9. Control: Microprocessor
- 10. Operation: Simplex Selective/Collective
- 11. Entrances: Single-Speed Side-Slide
- 12. Operating Fixtures: Innovation Industries
- 13. Power Supply: 208 Volts/ 3 Phase/ 60 Cycle
- 14. Motor: 20HP
  - a. Full Load: 65.4 amps
  - b. Locked Rotor: 311 amps.
- 15. Pit Depth: 4'-0"
- 16. Clear Overhead – 12'-0"
- 17. Machine Space Access Door Location: Side Of Hoistway At Lowest Landing

2.02 HYDRAULIC ELEVATORS

A. Hydraulic Passenger Elevator:

- 1. Hydraulic Elevator Equipment:
  - a. Holeless hydraulic with cylinder mounted within hoistway.
  - b. Capacity: 2000 pounds
  - c. Speed: 100 FPM Avg.
  - d. Travel Distance Floor to Floor: As shown on drawings.
  - e. No. of Landings and Openings Served
    - 1) 3 for three stories; basement / ground , level 1 and level 2
  - f. Car Platform: size as indicated on drawings for 2000# Capacity.
  - g. Operation: Simplex Selective Collective.
  - h. Entrance Type: Single Slide.
  - i. Opening Size: as indicated on drawings for 2000# Capacity
  - j. Power Supply: 208 Volt, 3 Phase, 60 HZ. A.C.
  - k. Machine Room: Elevator equipment room shall be located at the lower landing adjacent to the hoistway.
- 2. Drive System:
  - a. Variable voltage variable frequency (VVVF) to modulate motor speed.
- 3. Operation Control Type:
  - a. Selective Collective Automatic Operation Control.
- 4. Service Control Type:
  - a. Standard service control only.
- 5. Interior Car Height: 96 inch.

6. Electrical Power: 208 volts; alternating current (AC); three phase; 60 Hz.
  7. Rated Speed: 125 to 150 feet per minute.
  8. Hoistway Size: As indicated on drawings.
  9. Interior Car Platform Size: As indicated on drawings.
  10. Elevator Pit Depth: 48 inch.
  11. Overhead Clearance at Top Floor: 144 inch.
  12. Travel Distance: As indicated on drawings.
  13. Number of Stops: As indicated on drawings.
  14. Number of Openings: 3 Front.
    - a. Interior side for each of 3 level and non opposite side; elevator is single side opening cab.
  15. Hydraulic Equipment Location: Adjacent to bottom of hoistway shaft
- B. Oil Hydraulic Machine: The power unit shall be of a vertical compact, self-contained design including submerged pump, submerged drive motor, oil control unit assembly, and oil storage tank. The tank shall be located at the side of the hoistway. The power unit shall be accessed via a self-locking and self-closing door at the lowest landing.
- C. Pump: The vertically submerged pump shall be a positive displacement screw type, for maximum smoothness and quietness and shall be directly coupled to the motor.
- D. Motor: The vertically submerged drive motor shall be of standard manufacture and have a duty rating sufficient for hydraulic elevator requirements.
- E. Oil Control Unit: The oil control unit shall consist of electrically actuated and hydraulically operated valves with all adjustments accessible without removing the assembly from the oil lines. An automatic bypass valve shall provide smooth starting and stopping in the up direction and shall give regulated up leveling speed under varying load conditions in the car. The lowering and down leveling valve shall be fully adjustable for smoothness and speed of operation and shall be designed to close automatically if the power fails. Operation of a manual valve shall permit the car to be lowered at slow speed in the event of power failure. A safety check valve shall hold the car when the pump is at rest and a relief valve shall be provided which is capable of bypassing the entire output of the pump without increasing the system pressure more than 25% above the normal working pressure. Permanently install a liquid filled pressure gage on oil control unit.
- F. Oil Storage Tank: The oil storage tank shall be of sufficient capacity for the full travel of the car with a reserve of not less than 10 gallons, means of isolating oil in the tank for servicing of pump and valves, and a removable cover. Tank to be located in the hoistway adjacent to the elevator platform.
- G. Oil: Sufficient specially prepared hydraulic oil with greater than 400 degrees F. flashpoint and of proper viscosity and lubricating qualities shall be provided.
- H. All Hydraulic Supply Piping shall be at least schedule 40 pipe. Victaulic fittings are allowed. The system must be free from seepage at all joints.
- I. Shut-Off Valve: Manually operated valves shall be provided and installed in the oil supply line to isolate the cylinder and plunger unit from the hydraulic machine.
- J. Jack Units: The dual single-stage jacks shall be designed and constructed in accordance with the requirements of ASME code. The jacks shall be of sufficient size to lift the gross load at the rated speed. The jack units shall be factory tested to ensure freedom from leakage. No brittle material such as gray cast iron shall be used in the jack construction.
1. The jack units shall consist of a piston constructed of seamless steel tubing turned and straightened to factory specifications.
  2. A stop ring shall be welded to each piston.

3. The cylinder heads shall be designed with a removable packing, drip ring and bleeder valve.
  4. Install the jacks units plumb and attach them with brackets to the main guide rails.
- K. Buffers: Provide spring type buffers mounted to the pit floor. The buffers shall be designed and constructed in accordance with the requirements of ASME code.
- L. Car Frame and Platform: The car frame shall be constructed of structural steel per ASME code requirements. The car platform will be constructed of formed steel pans covered with a layer of  $\frac{3}{4}$ " plywood.
- M. Guide Shoes: Provide swivel nylon guide shoes rigidly bolted to the top and bottom of the car frame.
- N. Guide Rails and Brackets: Provide machined steel T section guide rails with tongue and groove rail joints. The rail brackets shall be manufactured to support the calculated rail loads. The brackets shall span from the back of the rail to the hoistway wall supports. Structural support points shall be supplied by the general contractor were indicated on the elevator layout drawings.

## 2.03 HOISTWAY EQUIPMENT

- A. Guide Rails
1. Standard steel tee section.
  2. Rail support brackets.
    - a. Spaced no more than 14'-0" apart.
    - b. Forged clips and suitable fastenings.
- B. Car Guide Shoes
1. Slide and swivel type.
- C. Car Frame and Platform
1. Side post construction of structural and formed steel shapes.
  2. Platform
    - a. Structural and formed steel framing.
    - b. Double layer plywood flooring.
    - c. Fireproofed on underside.
- D. Buffers
1. Spring type.
- E. Wiring
1. Car top inspection station with work light and alarm bell.
  2. Pit stop switch.
  3. Mounted adjustable terminal switches.
  4. Traveling cable and hatch wire to be continuous from car or hatch to machine room. No hatch junction box.
  5. Phone cable from car to controller.
  6. Leveling, floor, and intermediate floor slow down switches on car top for ease of adjustment.
- F. Holeless type
1. Dual jack units – Located on each side of car.
  2. Oil collection groove and drain connection in head assembly.
  3. Partial jack holes, if required



- G. Supply Piping and Fittings
  - 1. Shut Off Valve.

## 2.04 MACHINE ROOM EQUIPMENT

- A. Power Unit
  - 1. Electro – Hydraulic.
  - 2. Self contained – all components inside tank.
  - 3. Motor – submersible type, especially designed for hydraulic elevator duty.
    - a. Built in thermal contact to signal over heat condition.
  - 4. Pump – Positive Displacement Type.
  - 5. Direct Drive Coupling.
  - 6. Oil Control Unit – Single Unit Valve Assembly.
    - a. Up Start.
    - b. Relief Valve.
    - c. Check Valve.
    - d. Up/Down Leveling.
    - e. Main Down Valve.
  - 7. Manual Lowering Device.
    - a. Integral Pressure Gauge.
  - 8. Sound Isolation.
    - a. Between motor frame and tank.
    - b. Isolation pads under power unit.
  - 9. Silencer Device built into power unit.
  - 10. Oil level indicator.
    - a. Minimum 10 gal. Reserve.
- B. Motor Starter
  - 1. Across the Line Starting acceptable however provide: Wye-Delta as required to comply with requirements.
  - 2. Provided in enclosure mounted on front of power unit.
    - a. Motor leads prewired.
  - 3. Overload contacts.
- C. Controller
  - 1. Microprocessor type.
    - a. With on-board diagnostic devices. Do not provide controller that requires special “hand help” or attached diagnostic devices to trouble shoot.
  - 2. Provided in enclosure mounted on front of power unit.
    - a. Valve coils prewired.
  - 3. Low oil control. Car to lower & shut down after pre-set time.
  - 4. Provide Reverse Phase Relay.
  - 5. Provide UL Label on Controller.
  - 6. Include Battery Emergency
  - 7. Lowering Unit.

## 2.05 COMPONENTS

- A. Elevator Equipment:
  - 1. Motors, Hydraulic Equipment, Controllers, Controls, Buttons, Wiring, Devices, and Indicators: Comply with NFPA 70; see Section 26 0583.

2. Guide Rails, Cables, Buffers, Attachment Brackets and Anchors: Design criteria for components includes safety factors in accordance with applicable requirements of Elevator Code, ASME A17.1.
  3. Buffers:
    - a. Spring type for elevators with speed less than or equal to 200 fpm.
    - b. Oil type for elevators with speed greater than 200 fpm.
  4. Lubrication Equipment:
    - a. Lubrication Points: Visible and easily accessible.
- B. Electrical Equipment:
1. Motors: NEMA MG 1.
  2. Boxes, Conduit, Wiring, and Devices: Comply with NFPA 70; see Sections 26 0533.13 and 26 0583.
  3. Spare Conductors: Provide ten percent in extra conductors and two pairs of shielded audio cables in traveling cables.
  4. Include wiring and connections to elevator devices remote from hoistway and between elevator machine room. Provide additional components and wiring to suit machine room layout; see Section 26 0583.

## 2.06 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME A17.1, applicable local codes, authorities having jurisdiction (AHJ), and most recent PA Elevator Code.
- B. Accessibility Requirements: Comply with ADA Standards.
- C. Perform structural steel design, fabrication, and installation in accordance with AISC 360.
- D. Perform welding of steel in accordance with AWS D1.1/D1.1M.
- E. Fabricate and install door and frame assemblies in accordance with NFPA 80 and in compliance with requirements of authorities having jurisdiction.
- F. Perform electrical work in accordance with NFPA 70.
- G. Provide complete coordination of elevator hoistway and pit design confirm size, clearances for pit ladder, sump pit, and including providing and review shop drawings in particular to show where guide tracks are to be anchored into reinforced grouted solid CMU of hoistway.

## 2.07 HOISTWAY ENTRANCES

- A. Frames
  1. Square Profile.
  2. Bolted construction.
  3. 14 gauge steel – for up to [10" block] [6 ¾" drywall] hatch wall.
  4. #4 Stainless Steel finish.
  5. Tactile handicap jamb plates.
- B. Door Panels
  1. 16 gauge hollow metal.
  2. #4 Stainless Steel.
  3. 3Adjustable door gibs.
- C. Aluminum Sills

- D. UL Labeled Entrances
- E. Fascia, Toe Guards, Struts, Dust Covers as Required.

## 2.08 DOOR OPERATION

- A. D.C. Operation.
- B. Doors normally park closed.
- C. Retractable safety edge.
- D. Dual beam photo eye
- E. Protection.
  - 1. Intregal cutout switches.
- F. Adjustable door time.
  - 1. Slow speed closing.
  - 2. Door closing buzzer.

## 2.09 ELEVATOR CAB (CAR) ENCLOSURE

- A. Walls: Steel Shell with applied Wood Core Panels faced with Plastic Laminate with Enamel Reveals.
  - 1. Manufacturer's standard mica selection finish.
  - 2. Fireproofed on hatch side.
- B. The cab materials and interior design shall be provided per the description below:
  - 1. Wood Core Shell:  $\frac{3}{4}$ " industrial particle board faced with high pressure plastic laminate and backed with phenolic backer laminate. Panels will be bolted together to form a solid wall.
  - 2. Steel Shell: 14 gauge formed steel pans bolted together to form a solid wall. Provide panels with a black powder coat finish. Apply sound deaden mastic to the backs of each panel.
  - 3. Applied Panels:  $\frac{3}{4}$ " industrial particle board faced with high pressure plastic laminate and backed with phenolic backer laminate. The panels will be mounted to the cab shell with panel clips.
  - 4. Base: A 4 inch high 20 gauge 304 #4 stainless steel base shall be provided on all walls without doors.
  - 5. Canopy: Canopy shall be constructed of 12 gauge formed steel pans bolted together to form a solid canopy. Provide panels with a white powder coat finish. Provide the code required cutouts for the car top emergency exit and fan. Provide a hinged emergency exit and contact switch per ASME code requirements.
  - 6. Ventilation: A ventilation fan and vent slots are required (*coord w PA*) to meet the air change requirements specified in ASME. A 300 CFM fan shall be mounted to the car canopy. The fan shall have a direct connected motor and mounted on isolators to prevent transmission of vibrations to the canopy.
  - 7. Lighting: Configure the light fixtures to provide equal illumination across the cab without shadows or hotspots. The light fixtures shall be arranged to allow for future maintenance and repair. The light levels in the cab shall meet ASME code requirements.
  - 8. Ceiling: A drop ceiling shall be provided per the finish schedule below. The ceiling grids shall be arranged to allow access to the emergency top exit. All ceiling materials must meet ASME code requirements.

9. Cab Door: Sandwich construction with a 14 gauge steel backer panel and 16 gauge front panel. All steel will have a black powder coat finish. Clad the car side of the door will 20 gauge 304 #4 stainless steel.
  10. Cab Front: Construct the stationary return panel, transom, and strike post from 14 gauge 304 #4 stainless steel.
  11. Handrail: Handrails shall be designed to accommodate the weight of a person 250# sitting on it without deflection or damaging the handrail and cab wall. All handrail fasteners shall be concealed. Handrails shall be removable from inside the cab enclosure.
  12. Protection Pads and Buttons: Full height protection pads shall be provided on all walls and returns. The protection pads shall have cutouts for car operating panels and signals. All buttons are exposed and mechanically fastened at the top of the cab walls.
- C. Cab Interior Finish Schedule:
1. Shell: Wood core with flush plastic laminate finish.
  2. Canopy: White powder coat.
  3. Ceiling: Aluminum T frame ceiling grid with white translucent lay in panels. Fluorescent light strips mounted to canopy above drop ceiling.
  4. Cab Front, Return, Transom, and Strike Post: #4 Stainless steel.
  5. Cab Doors: #4 Stainless steel.
  6. Base: #4 Stainless steel
  7. Sill: Extruded aluminum mill finish
  8. Handrails: 3/8" x 2" #4 Stainless steel metal bar at side walls.
  9. Protection pads and buttons located on side walls and returns.
- D. Return: #4 Stainless Steel.
1. Faced with #4 Stainless Steel.
- E. Car Doors
1. [Faced on car side with Plastic Laminate with #4 Stainless Steel binder angle on leading edge.] [Faced on car side with #4 Stainless Steel.]
- F. Base
1. #4 stainless steel – 4" high.
- G. Canopy
1. 12 gauge steel.
  2. Painted white.
  3. Escape hatch.
- H. Ceiling
1. [Plastic Eggcrate] [Aluminum Eggcrate] [Lumasite].
  2. Fluorescent lighting above.
- I. Handrail
1. 3/8 x 2 #4 stainless steel – [Rear] [3 sides].
- J. Entrance columns & transom
1. #4 stainless steel
- K. Exhaust Fan
1. Single speed
  2. Aluminum grill

## 2.10 SIGNAL FIXTURES

- A. Car Operating Panel
  - 1. Illuminated push buttons.
  - 2. Stop switch as required.
  - 3. Door open/Door close push buttons.
  - 4. Keyed car light and fan switch.
  - 5. Alarm bell push button.
  - 6. Independent service key switch.
  - 7. Telephone cabinet with hinged door.
  - 8. Emergency light (and emergency bell provision).
  - 9. Handicap symbols – tactile.
  - 10. #4 stainless steel cover – applied type.
  
- B. Hall Operating Stations
  - 1. Illuminated pushbuttons.
  - 2. 1/2 Gong
    - a. One gong to indicate car to travel “up” and two gongs to indicate car to travel “down.”
  - 3. #4 stainless steel cover.
  - 4. Car Direction Indicator
  - 5. Hall Lanterns and Gongs as selected and approved
    - a. Located above door opening at each floor
    - b. 1/2 Gong.
    - c. One gong to indicate car to travel “up” and two gongs to indicate car to travel “down.”
    - d. #4 stainless steel cover.
  
- C. Car direction Indicator
  - 1. A lantern with visual and audible indicator located in the cab enclosures strike post. The lantern will indicate the direction of the car when the doors are in the open position. The indicator shall sound one in the up direction and twice in the down direction. The cover plate shall be #4 stainless steel.
  
- D. Car Position Indicator
  - 1. Located in transom over car door.
  - 2. Floor passing signal (3 stop only).
  - 3. #4 stainless steel cover.
  - 4. A segmented digital position indicator shall be provided integrated with the Main COP. It shall indicate the floor at which the car is stopped or passing and the direction the car is traveling. The cover plates shall be #4 stainless steel.
  
- E. Hall Position Indicator
  - 1. Located over door at main floor.
  - 2. #4 stainless steel cover.
  
- F. Firefighters Service Phase I & II as required
  - 1. Keyed fire switch, light and call cancel button in car operating panel.
  - 2. Keyed fire switch in main floor hall station.
  - 3. Fire service buzzer in car top station.
  
- G. Access Switches
  - 1. Keyed access switches at terminal landings.

2. Keyed inspection switch in car operating panel.
  3. #4 stainless steel covers.
  4. Down travel limit switch in hatch.
- H. Mass EMT Service as selected and approved
1. Keyed hall call switch at egress floor.
  2. Keyed switch on car panel.
  3. Staff of Life symbols on door jamb at egress floor.

## 2.11 OPERATION CONTROLS OVERVIEW

- A. Elevator Controls: Provide landing operating panels, landing indicator panels, and as shown on drawings.
1. Landing Operating Panels: Metallic type, one for originating "Up" and one for originating "Down" calls, one button only at terminating landings; with illuminating indicators.
  2. Landing Indicator Panels: Illuminating.
  3. Comply with ADA Standards for elevator controls.
- B. Interconnect elevator control system with building security, fire alarm, and smoke alarm systems.
- C. Door Operation Controls:
1. Program door control to open doors automatically when car arrives at floor landing.
  2. Render "Door Close" button inoperative when car is standing at dispatch landing with doors open.
  3. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equipped with photo-electric light rays.
- D. Lobby Monitoring Panel:
1. Locate status indicator and control panel for each individual elevator and group of elevators as indicated on drawings.
  2. Mount panel in console as indicated on drawings.
  3. Etch face plate markings in panel, and fill with paint of contrasting color.
  4. Include direction indicator displaying landing "Up" and "Down" calls registered at each landing floor.
  5. Include position and motion display for direction of travel of each elevator. Display appropriate graphic characters on non-glare screen. Indicate position of cars at rest and in motion.
  6. Include "Firefighter's Service Switch" that manually recalls each elevator to main floor.
- E. Provide "Firefighter's Emergency Operation" in accordance with ASME A17.1, applicable building codes, authorities having jurisdiction (AHJ), and Phila Fire Marshal.
1. Designated Landing: Main Lobby.
- F. Special Operation Controls:
1. Program system as follows:
    - a. When elevator is called from grade level /exterior door it must only take passengers to main lobby and require discharge before access to other levels is permitted; submit sequence for review and approval.
    - b. When elevator is called from other than grade / exterior level; then access is released to any unlocked level.
    - c. Provide within cab a key lock where any level can be temporarily locked and unlocked to access.

## 2.12 CONTROLS DETAIL - CONTROLLER

- A. The elevator controller shall utilize a microprocessor-based logic system manufactured by Virginia Controls. The controller shall comply with (ANSI/ASME 17.1) safety code for elevators. The system shall provide comprehensive means to access the computer memory for elevator diagnostic purposes without need for any external devices and shall have permanent indicators to indicate important elevator status as an integral part of the controller. Systems that require hookup of external devices for troubleshooting are not acceptable. The elevator control equipment shall be provided such that at least three (3) elevator service companies can maintain the equipment. Immediate availability of replacement parts shall be guaranteed, and no special proprietary diagnostic devices will be utilized. An O.E.M. control, serviceable only by the O.E.M. will not be accepted. Controller shall be provided with the capability of in-the field changes for certain variables such as door time. These changes should be stored permanently using non-volatile memory. Thus, if the power to the unit is disconnected, the system will maintain the programmed variables. The Car Diagnostic Display shall have the capability of selecting either the operational or programming modes and/or displaying the status of all inputs and outputs.
- B. Failure of any single magnetically operated switch, conductors, or relay to release in the intended manner; or the occurrence of a single accidental ground or short circuit shall not permit the car to start or run if any hoistway door or gate interlock is UNLOCKED or if any hoistway door or car door or gate contact is not in the made position. Furthermore, while on car top inspection or hoistway access operation, failure of any single magnetically operated switch, conductors or relay to release in the intended manner; or the occurrence of a single accidental ground shall not permit the car to move even with the hoistway door locks and car door contacts in the closed or made position.
- C. Dedicated permanent status indicators shall be provided on the controller to indicate when the safety string is open, when the door locks are open, when the elevator is running at high speed, when the elevator is on independent service, when the elevator is on fireman's service, when the elevator out of service timer has elapsed or when the motor limit timer or valve limit timer has elapsed.
- D. The elevator shall not require the functioning or presence of the microprocessor to operate normally during car top inspection operation or hoistway access operation in order to provide a reliable means to move the car if the microprocessor fails.
- E. A motor limit timer function shall be provided which, in the event of the pump motor being energized longer than a predetermined time, shall cause the car to descend to the lowest landing, open the doors automatically and then re-close them and the elevator shall then be rendered unresponsive to any automatic operation. Operation may be restored by cycling the power disconnect switch or putting the car on access or inspection operation.
- F. A valve limit timer shall be provided which shall automatically cut off current to the valve solenoids if they have been energized longer than a predetermined time. The car calls shall then be cancelled, and the car taken out of service automatically. Operation may be restored by cycling the power disconnect switch or putting the car on access or inspection operation.
- G. An out of service timer (T.O.S.) shall be provided which will automatically take the car out of service if the car is delayed in leaving the landing while there are calls existing in the building. The car shall not respond to hall calls while in this mode of operation.
- H. Door protection timers shall be provided for both the open and close directions which will help protect the door motor and which will help prevent the car from getting stuck at a landing. The door open protection timer shall cease attempting to open the door after a predetermined time in the event that the door is prevented from reaching the open position. The door close

protection timer will reopen the doors for a short time in the event that the door-closing attempt fails to close the door locks after predetermined time.

- I. A minimum of three different door standing open times shall be provided. A car call time value shall predominate when a car call only is cancelled. A hall call time value shall predominate whenever a hall call is cancelled. In the event of a door reopen from the safety edge, or photo eye, a separate short door time value shall predominate.
  - J. Hall call or car call registration and lamp acknowledgment shall be by means of a single wire per call besides the power busses. Systems that register the call with one wire and light the call acknowledgment lamp with a separate wire are not acceptable. Phase I emergency recall operation, and Phase II emergency in-car operation shall be provided within the controller according to applicable local codes.
  - K. Independent service operation shall be provided such that actuation of a key switch in the car-operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls and will ignore hall calls. Car and hoistway doors will only close by constant pressure on car call buttons or a door close button until the car starts to move. While on independent service any hall arrival lanterns or jamb mounted arrival lanterns and gongs shall be inoperative.
  - L. The car shall be equipped with two-way leveling to automatically bring the car within plus or minus 1/4 inch of exact level at any landing regardless of load up to maximum capacity.
  - M. A timer shall be provided to limit the amount of time a car is held at a floor due to a defective hall call or car call including stuck pushbuttons. Call demand at another floor shall cause the car to eventually ignore the defective call and continue to provide service in the building.
  - N. DOOR TIMING - Separate adjustable timing means shall be provided to establish independent minimum passenger transfer time for car stops, hall stops, main lobby stops, and door reversal operations (short door time).
  - O. Simplex selective collective automatic operation shall be provided for the single car installations. Operation of one or more car call or hall call buttons shall cause the car to start and run automatically provided the hoistway door interlocks and car door contacts are closed. The car shall stop at the first car call or hall call set for the direction of travel of car. Stops shall be made in the order in which the car calls or hall calls set for the direction of operation of the elevator are reached, irrespective of the order in which they were registered. If only hall calls set for the opposite direction of travel of the elevator exist ahead of the car, the car shall proceed to the most distant hall call, reverse direction, and start collecting the calls.
  - P. Simplex home landing operation shall be provided and if no calls are registered shall cause the car to travel to a predetermined home landing floor and stop without providing a door operation.
  - Q. If the car is enroute to the home landing and a call appears from the direction opposite to which the car is traveling, the car shall slow down, stop, and then accelerate in the opposite direction, toward the call. The home landing function shall cease instantly upon the appearance of a normal call and the car shall proceed non-stop in response to any normal call.
  - R. Elevator controller shall be as manufactured by Virginia Controls including soft start features to limit inrush current.
- 2.13 CONTROLS DETAIL - LOW OIL CONTROL
- A. A low oil control feature shall protect the hydraulic components if the elevator fails to complete its upward travel in the normal time.



- B. Actuation of the low oil control circuit shall stop the pump and lower the car to the lowest landing. Power-operated doors shall open to permit passengers to depart and shall then close. The car shall remain parked at that landing completely removed from demands for service.
- C. To return the car to normal service, the malfunction shall be corrected and the elevator controls reset in the machine room.

#### 2.14 OPERATION CONTROL TYPE

- A. Single Automatic (Push Button) Operation Control: Applies to car in single elevator shaft.
  - 1. Refer to description provided in ASME A17.1.
  - 2. Set system operation so that momentary pressure of landing button dispatches car from other landing to that landing.
  - 3. Allow call registered by momentary pressure of landing button at any time to remain registered until car stops in response to that landing call.
  - 4. If elevator car door is not opened within predetermined period of time after car has stopped at terminal landing allow car to respond to call registered from other landing.
- B. Selective Collective Automatic Operation Control: Applies to car in single elevator shaft.
  - 1. Refer to description provided in ASME A17.1.
  - 2. Automatic operation by means of one button in the car for each landing served and by "UP" and "DOWN" buttons at the landings.
  - 3. Stops are registered by momentary actuation of landing car buttons without consideration of the number of buttons actuated or the sequence buttons are actuated, but the stops are made in the order that landings are reached in each direction of travel.
  - 4. All "UP" landing calls are made when car is traveling in the up direction.
  - 5. All "DOWN" landing calls are made when car is traveling in the down direction.
  - 6. Uppermost and lowermost calls are answered as soon as they are reached without consideration of the car travel direction.

#### 2.15 EMERGENCY POWER

- A. Set-up elevator operation to run with building emergency power supply when the normal building power supply fails, and in compliance with ASME A17.1 requirements.
- B. Building Emergency Power Supply: Supplied by backup generator; provide elevator system components as required for emergency power characteristics with phase rotation the same as for normal power.
  - 1. Provide transfer switches and auxiliary contacts.
  - 2. Install connections to power feeders.
- C. Emergency Lighting: Comply with ASME A17.1 elevator lighting requirements.
- D. Provide operational control circuitry for adapting the change from normal to emergency power.
- E. Upon transfer to emergency power, advance one elevator at a time to a pre-selected landing, stop car, open doors, disable operating circuits, and hold in standby condition.

#### 2.16 MATERIALS

- A. Steel Cylinder Casing: ASTM A139/A139M, Grade A steel.
- B. Rolled Steel Sections, Shapes, Rods: ASTM A36/A36M.

- C. Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel), with matte finish.
- D. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- E. Stainless Steel Sheet: ASTM A666, Type 304; No. 4 Brushed finish unless otherwise indicated.
- F. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.
- G. Extruded Brass Shapes: ASTM B455/B455M, Copper Alloy UNS C38500, Architectural Bronze, 57 percent copper, polished finish.
- H. Seamless Brass Tubes: ASTM B135/B135M, Copper Alloy UNS C22000, Commercial Bronze, 90 percent copper, polished finish.
- I. Brass Sheet: ASTM B36/B36M, Copper Alloy UNS C38500, Architectural Bronze, 57 percent copper.
- J. Extruded Aluminum: ASTM B221 (ASTM B221M), natural anodized finish unless otherwise indicated.
- K. Aluminum Sheet: ASTM B209/B209M, 3105 alloy, O temper.
- L. Plywood: PS 1, Structural I, Grade C-D or better, sanded.
- M. Resilient Flooring: Luxury Vinyl tile flooring and Resilient base, see Section 09 6500, Type same as main floor level unless indicated otherwise.
- N. Plastic Laminate: NEMA LD 3, Type HGS, color as selected by Architect from manufacturer's standard line of colors.

#### 2.17 HOISTWAY EQUIPMENT - Provisions for Hoistway Access

- A. Keyway - Furnish and install hoistway door unlocking devices at all landings in accordance with requirements of the latest Edition of the American Standard Safety Code for Elevators, Dumbwaiters, and Escalators, and as permitted by the Local Code.
- B. The hoistway door-unlocking device shall unlock and permit the opening of the hoistway door from the access floors irrespective of the position of the car. The design of the device shall be such as to prevent unlocking the door with common tools. The means for unlocking the door shall be available and used only by inspectors, maintenance men, and repair men.
- C. Hoistway Access – Furnish and install hoistway access switches and associated devices in accordance with requirements of the latest edition of the American Society of Mechanical Engineers A17.1 and permitted by local code. Locate hoistway key switches at the top and bottom landing.

#### 2.18 HOISTWAY EQUIPMENT - Top of Car Operating Device

- A. An operating device shall be provided on the top of the car located in the front between the car crosshead and hoistway door, complete with an Emergency Stop Switch, a Selections Switch, and UP and DOWN Operating Buttons. This device shall comply with ANSI A17.1 and local codes.
- B. Operation from the top of the car shall not be permissible unless all electric door contacts are closed.

2.19 HOISTWAY EQUIPMENT - Pit Stop Switch

- A. A switch shall be located in each elevator pit, in accordance with ANSI A17.1 and local codes.

2.20 ELECTRIC WIRING

- A. Complete insulated wiring shall be furnished and installed to connect all parts of the equipment furnished by the elevator contractor. Wiring shall conform to the requirements of the latest edition of the National Electrical Code. Include rigid conduit or EMT, at least 1/2" diameter, and short lengths of flexible conduit. Conduit or EMT shall terminate in junction boxes. Conduit, EMT, wiring duct, conduit fittings, enclosures and junction boxes shall be galvanized steel or aluminum.
- B. All wiring shall have a flame retarding moisture resisting outer cover and shall be run in metal conduit, flexible metallic tubing, or wire ducts.
- C. Traveling cables shall have flame retarding and moisture resisting outer cover. They shall be flexible and suitably suspended to relieve strains in the individual conductors. Provide the required quantity plus at least 10 percent spares. All wiring between telephone in car and a junction box in elevator machine room shall be provided by the elevator contractor. Conductors shall be numbered to correspond to numbered terminals at the car and machine room.
- D. Terminal blocks shall be coded to identify the circuits. Multi-conductor cables shall have the conductor color coded and numbered.
- E. Each elevator car shall be provided with a suitable GFCI receptacle fitted with a wire lamp guard on top of the car and a suitable duplex plug receptacle.
- F. Unless otherwise specified, control wiring shall be minimum size #18 AWG. Wire size shall be large enough so that the voltage drop under inrush conditions will not adversely affect operation of the controls.
- G. Phase Protection: Provide 3-phase power monitor for elevator power supply which monitors phase loss, low voltage, phase reversal, phase unbalance, and has an automatic reset. The three phase power monitor shall be Time Mark Corp. model 257 or model approved by the Elevator Shop.
- H. Execution:
  - 1. Install all power wiring in raceway systems. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.
  - 2. Splice cables and wires only in outlet boxes, junction boxes or pull boxes. (Note - No wire splicing allowed in raceway or wireducts).
  - 3. Install cable supports for all vertical feeders in accordance with the NEC. Provide Kellum GRIP type supports which firmly clamp each individual cable and tighten due to cable weight.
  - 4. All terminal strip connections shall be identified with corresponding reference numbers from cable termination chart and electrical straight-line diagrams.
- I. EMERGENCY ALARM BELL
  - 1. An alarm bell shall be provided and mounted on the car. When the emergency alarm bell button in the car is pressed, the button shall illuminate and the alarm bell shall sound.

## 2.21 LANDING SYSTEM

- A. This landing system shall provide high speed stepping signals, one-floor-run stepping signals, leveling, and door zone signals. Each output signal shall be electrically isolated and shall be capable of reliably operating at 120 VAC.
- B. The system shall consist of a steel tape with mounting hardware to accommodate the complete travel of the elevator, a car top assembly with tape guides and sensors, and magnetic strips for stepping and leveling.
- C. The leveling and stopping accuracy of the system shall be within 1/4 inch of the floor level and shall correct for over travel or under travel to within the same accuracy, regardless of load variations or direction of travel.
- D. Landing control system shall be as manufactured/recommended by the controller manufacture.

## 2.22 HOISTWAY ENTRANCES

- A. Complete entrances bearing UL fire labels.
- B. Frames: Hollow metal assembly fabricated from not less than 16ga material. Permanently attach ADA complying floor designations. Provide the main egress landing plates with the "Star" designation.
- C. Door Panels: 18 gauge steel, sandwich construction without binder angles. Provide a minimum of two gibes per panel, one at leading and one at trailing edge with both gibes in the sill groove their entire length of travel. Emergency interlock release keyways are required at each landing. Keyway shall include front trim ring.
- D. Sight Guards: Same material and finish as hoistway entrance door panels.
- E. Sills: Extruded aluminum.
- F. Fascia: 16ga furniture steel with manufacturer's standard finish.
- G. Frame and Door Finish:
  - 1. Baked enamel finish on doors and frames at all landings.

## 2.23 CAR AND HOISTWAY ENTRANCES

- A. Elevator, No. LIB 1:
  - 1. Car and Hoistway Entrances from Exterior:
    - a. Hoistway Fire Rating: 2 Hours.
    - b. Elevator Door Fire Rating: 1-1/2 Hours.
    - c. Framed Opening Finish and Material: Stainless Steel.
    - d. Car Door Material: Powder coat on steel, with rigid sandwich panel construction.
    - e. Hoistway Exterior Door Material: Stainless Steel.
    - f. Door Operation: Side opening, two speed.
    - g. Door Width: 36 inch.
    - h. Door Height: 84 inch.
    - i. Sills: Extruded aluminum.
  - 2. Car and Hoistway Entrances, Main Elevator Lobby:
    - a. Hoistway Fire Rating: 2 Hours.
    - b. Elevator Door Fire Rating: 1-1/2 Hours.

- c. Framed Opening Finish and Material: Alkyd enamel on steel.
  - d. Car Door Material: Powder coat on steel, with rigid sandwich panel construction.
  - e. Hoistway Door Material: Powder coat on steel, with rigid sandwich panel construction.
  - f. Door Operation: Side opening, two speed.
  - g. Paint Color: As indicated.
  - h. Door Width: 36 inch.
  - i. Door Height: 84 inch.
  - j. Sills: Extruded aluminum.
3. Car and Hoistway Entrances, Lower Floor Elevator Lobby:
- a. Framed Opening Finish and Material: Alkyd enamel on steel.
  - b. Car Door Material: Powder coat on steel, with rigid sandwich panel construction.
  - c. Hoistway Door Material: Powder coat on steel, with rigid sandwich panel construction.
  - d. Door Type: Double leaf.
  - e. Door Operation: Side opening, two speed.
  - f. Paint Color: As indicated.
  - g. Door Width: 36 inch.
  - h. Door Height: 84 inch.
  - i. Sills: Extruded aluminum.

## 2.24 CAR EQUIPMENT AND MATERIALS

### A. Elevator Car:

- 1. Car Design: Model as indicated on drawings by basis of design or equal .
- 2. Car Operating Panel: Provide main and auxiliary; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open/Door Close" buttons, "Door Open" button, "Door Close" button, alarm button, and as indicated on drawings.
  - a. Panel Material: Integral with front return; one per car.
  - b. Car Floor Position Indicator: Above door with illuminating position indicators.
  - c. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch above car finished floor.
  - d. Provide matching service cabinet integral with front return panel, with hinged door and keyed lock in each car.
- 3. Ventilation: Single speed fan with grille in ceiling.
- 4. Flooring: Carpeting.
- 5. Wall Base: Resilient base, 4 inch high.
- 6. Front Return Panel: Match material of car door.
- 7. Door Wall: Baked enamel on steel.
- 8. Side Walls: Baked enamel on steel.
- 9. Rear Wall: Baked enamel on steel.
- 10. Hand Rail: Stainless steel, at all three sides. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
  - a. Flat Bar Stock, Solid: as indicated on drawings inch thick by as indicated on drawings inch high.
  - b. Round, Metal Tube: 1-1/2 inch diameter; as indicated on drawings,
  - c. Stainless Steel Finish: No. 4 Brushed.
- 11. Ceiling: as indicated on drawings .
  - a. Canopy Ceiling: Stainless steel.

### B. Car Accessories:

1. Certificate Frame: Stainless steel frame glazed with tempered glass, and attached with tamper-proof screws.

#### 2.25 CAR EQUIPMENT - Power Door Operation (GAL-MOVFR)

- A. The car and hoistway doors shall be operated quietly and smoothly by an electric operator which shall open and close the car door and respective hoistway door simultaneously. The doors shall open automatically when the car is leveling at the respective floor and, when operating without an attendant, shall close after a predetermined time has elapsed. Momentary pressure on the "Open Door" button in the car shall cause the doors to remain open or, if closing, to reopen and reset the time interval.
- B. The doors shall be opened at rated speed (2ft/sec.) and the closing speed shall be per Code. Door closing force shall be as allowed by code.
- C. An electric contact for the car doors shall be provided which shall prevent elevator movement away from the floor unless the door is in the closed position as defined by code.
- D. Each hoistway door shall be equipped with an auxiliary door closing device and a positive electro-mechanical interlock to prevent the operation of the elevator until the interlock circuit is established and the doors are locked and closed.
- E. Door Protection and Reopening Device
  1. Formula Systems Safescreen.
- F. Adaptive Door Timing
  1. Door open times will be varied subject to the call situation causing the stop:
    - a. Shortest timing, when car call only causes stop.
    - b. Longer timing, when hall call only causes stop.
    - c. Longest timing, when coincident hall and car calls exist.

#### 2.26 OPERATING FIXTURES - Car Operating Panel (Innovation Industries FIXTURES)

- A. The operating panels in the car shall consist of one #4 stainless steel applied cover plate. The main control panel shall contain a series of push buttons with illuminated call registration devices, numbered to correspond to the various landings serviced, In Car Stop Key Switch, Alarm Button (connected to a bell located on the car), and a Door Close, Door Open button for each entrance. Alarm bell shall be operated from its own independent battery pack power supply. The main control panel shall also contain separate key operated switches for Fire service, inspection, independent service, car lights and car fan. All the key switch cylinders shall be standard Innovation fixtures. Fire Fighters Service operating instruction shall be etched and filled with red filler in the main car-operating panel. Braille denotations shall be of the replaceable type bolted from the rear of contrasting colors mounted per ADA Guidelines.
- B. Buttons shall be translucent with a white insert and black halo. The LED lamp shall illuminate to indicate a call has been registered.
- C. Provide emergency light in car operating panel with nickel cadmium batteries.

#### 2.27 OPERATING FIXTURES - Hall Push Button (Innovation Industries FIXTURES)

- A. Hall push buttons shall be installed at each floor to permit waiting passengers to call the elevator to the floor.

- B. Fixtures shall have up and down buttons at intermediate floors and single buttons at top and bottom floors.
- C. Buttons shall be translucent with a white insert and black halo. The LED lamp shall illuminate to indicate a call has been registered. Button shall remain illuminated until the call has been answered.

#### 2.28 OPERATING FIXTURES - Communication System

- A. Provide hands-free emergency telephone integral with the main car-operating panel with wiring (shielded pairs) to terminals on control panel in machine room.
- B. Phone shall keep working in the event of a power failure. Phone shall be one push button to talk type and flash when call is answered.

#### 2.29 ACCEPTABLE PRODUCTS

- A. Fixtures (Car Operating Panel, Hall Push Button): Innovation Industries. Or approved equal.
- B. MICRO-PROCESSOR BASED CONTROLLER (For Hydraulic Elevators): Virginia Controls. Or approved equal.
- C. DOOR OPERATOR & EQUIPMENT: GAL Manufacturing Corp. MOVFR Operator, car and hall door tracks, car and door hangers with roller assemblies. All interlocks, pickup rollers and operating linkage manufactured by GAL. Or approved equal.
- D. HYDRAULIC PACKAGE: Basis of Design: Manufactured Canton Elevator.

#### 2.30 MACHINE ROOM FITTINGS

- A. Wall-Mounted Frames: Glazed with clear plastic; sized as required. Provide one chart each for master electric and hydraulic schematic and for lubrication chart. Install charts.
- B. Key Cabinet: Wall-mounted, lockable, keyed to building keying system, for control and operating panel keys.
  1. Provide two key cabinet keys.
  2. Provide two control/operating panel keys.
  3. Provide two card access keys.
- C. Monitoring Device Interface:
  1. Fabricate one multiple terminal block in controller relay panel or selector, in location indicated, for connection of monitoring devices for:
    - a. Landing and car registration circuits.
    - b. Motor generator running circuits.
    - c. Load weighing circuits.
    - d. Up and down peak programming circuits.
    - e. Independent service switches.
  2. Label terminals for use with alligator test clips.

#### 2.31 FINISHES

- A. Field Painting: See Section 09 9123 for additional requirements.

- B. Powder Coat on Steel: Clean and degrease metal surface; apply one coat of primer; two coats of powder coat.
- C. Baked Enamel on Steel: Clean and degrease metal surface; apply one coat of primer sprayed and baked; two coats of enamel sprayed and baked.
- D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20 Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction (AHJ).
- E. Finish Paint for Metal Surfaces: Alkyd enamel, semi-gloss, color as selected, complying with VOC limitations of authorities having jurisdiction (AHJ).
- F. Clear Anodized Finish: Class I, AAMA 611 AA-M12C22A41, clear anodic coating with electrolytically deposited organic seal; not less than 0.7 mil, 0.0007 inch thick.
- G. Color Anodized Finish: Class I, AAMA 611 AA-M12C22A44, electrolytically deposited colored anodic coating not less than 0.7 mil, 0.0007 inch thick.
- H. High Performance Organic Finish: AAMA 2604; multiple coats, thermally cured fluoropolymer system.

## 2.32 Auxiliary Operations - Firefighter's Service

- A. The following operation is for the use of firemen and other authorized personnel and shall meet all current codes as most recently adopted by the Authority Having Jurisdiction.
  - 1. Automatic passenger elevators shall conform to the following:
    - a. A three position (on, off, and by-pass) key-operated switch shall be provided at the main floor for each single elevator or each group of elevators. The key shall be removable only in the "on" and "off" positions. When the switch is in the "on" position, all elevators controlled by this switch and which are on automatic service shall return non-stop to the main floor, and the doors shall open and remain open.
      - 1) An elevator traveling away from the main floor shall reverse at the next available floor without opening its doors.
      - 2) Elevators equipped with automatic power-operated doors and standing at a floor other than the main floor, with doors open, shall close the doors without delay and proceed to the main floor.
      - 3) Door reopening devices for power-operated doors which are sensitive to smoke, heat or flame shall be rendered inoperative.
      - 4) All car and corridor call buttons shall be rendered inoperative and all call registered lights and direction lanterns shall be extinguished and remain inoperative.
      - 5) A car stopped at a landing shall have its "Emergency Stop Switch" rendered inoperative as soon as the doors are closed and it starts toward the main floor. A moving car, traveling to or away from the main floor, shall have its "Emergency Stop Switch" rendered inoperative immediately.
      - 6) A sensor in each elevator lobby, which when activated prevents cars from stopping at that floor, shall not be substituted for the above requirements.
    - b. Sensing Devices: In addition to the key-operated switch required in "1" above, heat and smoke or products of combustion sensing devices shall be furnished and installed per local code requirements. The activation of a sensing device in any elevator lobby shall cause the car to return non-stop to the main floor. The key operated switch when moved to the "by-pass" position, shall restore normal service independent of the sensing devices. Smoke detectors shall be supplied and installed by other trades and are not included in this scope of work.



- c. A three position (off-hold-on) key-operated switch shall be provided in each car and shall be effective only when the main floor key-operated switch is in the "on" position or a sensor has been activated and the car has returned to the main floor or other approved level. The key shall be removable in all positions, and shall not change the operation until the car is at a floor with doors fully opened.
- d. The operation of elevators on Fire service shall be as follows:
  - 1) An elevator shall be operable only by a person in the car.
  - 2) Elevators shall not respond to elevator corridor calls.
  - 3) The opening of power-operated doors shall be controlled only by continuous pressure "open" buttons or switches. If the switch or button is released prior to the doors reaching the fully open position, the doors shall automatically reclose. Open doors shall be closed by continuous pressure on "Door Close" switch or button.
  - 4) Means shall be provided to cancel registered car calls.
  - 5) When the switch is in the 'hold' position, the car shall remain at the floor with its doors open.
  - 6) Elevators can be removed from individual car fire service by moving the key-operated switch to the "off" position and the car is at the main floor or other approved level.
- e. The switches required above shall be operated by the same key but are not a part of a building master key system. There shall be a key for the main floor switch and for each elevator in the group and these keys shall be kept on the premises by persons responsible for maintenance and operation of the elevators, in a location readily accessible to authorized persons, but not where they are available to the public. TURN OVER ALL KEYS TO OWNER
- f. Instructions of operation shall be provided as required by code.

### 2.33 Auxiliary Operations - Independent Service Operation

- A. A two-position switch shall be provided in the car-operating panel.
- B. When the switch is placed in the independent service position, the mode of operation shall be amended as follows:
  - 1. The car is disconnected from the supervisory system.
  - 2. Existing car calls shall be canceled.
  - 3. The cars shall bypass landing calls.
  - 4. Continuous pressure on the car button of the selected floor shall close the doors and start the car toward the selected floor. Pressure shall be required on the button until the car starts. Releasing the car button before the car starts shall cause the doors to automatically reopen.
  - 5. After the car has arrived at the floor and the doors have automatically opened, the cars shall remain until another car button is pressed or until the key switch is returned to the normal position.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting this work.
- B. Verify that hoistway, pit, machine room, and CMU Hoistway are ready for work of this section.
- C. Verify hoistway shaft and openings are of correct size and within tolerance.

- D. Verify location and size of machine foundation and position of machine foundation bolts.
- E. Verify that electrical power is available and of correct characteristics.

### 3.02 SITE INSPECTION

- A. Prior to preparation of drawings, the contractor shall examine the hoistway and machine room areas and verify that no discrepancies or irregularities exist which would adversely affect the execution of the work.
- B. No exposed wiring or conduit shall be run in finished areas without prior written approval of owner.

### 3.03 PERFORMANCE

- A. Contract Speed
- B. Actual speed shall vary no more than +/- 10% from speed specified under any loading condition or direction of travel.
- C. Leveling accuracy
  - 1. Consistently level within +/- 1/4" under all loading conditions.

### 3.04 PREPARATION

- A. Arrange for temporary electrical power for installation work and testing of elevator components.
  - 1. See Section 01 5100 - Temporary Utilities for additional requirements.
- B. Excavate for in-ground hydraulic cylinder casing, and remove subsoil from site; see Section 31 2316 for additional requirements.
- C. Maintain in-ground shaft alignment of 1/2 inch maximum from plumb.
  - 1. Fill over-excavated shaft depth with lean concrete.
- D. Maintain elevator pit excavation free of water.
- E. Maintain in-ground elevator shaft excavation free of water.
- F. Place in-ground plunger casing full depth of shaft. Align to 1/4 inch from plumb. Cut top of casing at hoistway pit slab elevation.
- G. Backfill around in-ground cylinder casing; see Section 31 2323.

### 3.05 INSTALLATION

- A. General
  - 1. Install each elevator in accordance with accepted manufacturer's directions and ANSI A17.1 and all applicable codes.
  - 2. Install machine room equipment with clearance complying with ANSI A17.1.
  - 3. Install items so that they may be removed by portable hoists or other means for ease of maintenance.
- B. Coordinate this work with installation of hoistway wall construction.
- C. Guide Rails

1. Install rails continuously for full height of hoistway with no gap at joints.
  2. Align rails vertically within a tolerance of 1/32".
- D. Power Unit: Fill system with oil as per pump manufacturers recommendations.
- E. Entrances: Align within tolerance of 1/32".
- F. Install system components, and connect equipment to building utilities.
- G. Provide conduit, electrical boxes, wiring, and accessories; see Sections 26 0533.13 and 26 0583.
- H. Install hydraulic piping between cylinder and pump unit.
- I. Mount machines, motors, pumps, and associated equipment on vibration and acoustic isolators.
1. Place on structural supports and bearing plates.
  2. Securely fasten to building supports.
  3. Prevent lateral displacement.
- J. Jack Unit
1. Install plumb & true.
  2. If units are wrapped with corrosion protective material, install and patch as required.
- K. Install hoistway, elevator equipment, and components in accordance with approved shop drawings.
- L. Install guide rails to allow for thermal expansion and contraction movement of guide rails.
- M. Accurately machine and align guide rails, forming smooth joints with machined splice plates.
- N. Bolt brackets to inserts placed in concrete form work.
- O. Field Welds: Chip and clean away oxidation and residue with wire brush; spot prime surface with two coats.
- P. Install hoistway door sills, frames, and headers in hoistway walls; grout sills in place, set hoistway floor entrances in alignment with car openings, and align plumb with hoistway.
- Q. Fill hoistway door frames solid with grout; see Section 04 2000.
- R. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
- S. Machine Room Components: Clean and degrease; prime one coat, finish with one coat of enamel.
- T. Wood Surfaces not Exposed to Public View: Finish with one coat primer; one coat enamel.
- U. Adjust equipment for smooth and quiet operation.
- 3.06 TOLERANCES
- A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.
- B. Car Movement on Aligned Guide Rails: Smooth movement, without any objectionable lateral or oscillating movement or vibration.

### 3.07 FIELD QUALITY CONTROL

- A. See Section 01 4000 - Quality Requirements for additional requirements.
- B. Testing and inspection by regulatory agencies certified in accordance with ASME QEI 1 will be performed at their discretion.
  - 1. Schedule tests with agencies and notify Owner and Architect.
  - 2. Obtain permits as required to perform tests.
  - 3. Document regulatory agency tests and inspections in accordance with requirements.
  - 4. Perform tests required by regulatory agencies.
  - 5. Furnish test and approval certificates issued by authorities having jurisdiction.
- C. Perform testing and inspection in accordance with requirements.
  - 1. Inspectors shall be certified in accordance with ASME QEI-1.
  - 2. Perform tests as required by ASME A17.2.
  - 3. Provide at least two weeks written notice of date and time of tests and inspections.
  - 4. Supply instruments and execute specific tests.
- D. Operational Tests:
  - 1. Perform operational tests in the presence of Owner and Architect.
  - 2. Test single elevator system by transporting at least 4 persons up from main floor to top floor landings during a five minute period.
  - 3. At an agreed time, and the building occupied with normal building traffic, conduct tests to verify performance.
    - a. Furnish event recording of each landing call registrations, time initiated, and response time throughout entire working day.
  - 4. Set period of time elevator takes to travel between typical floor landings at not more than 60 seconds.
    - a. Measure time from moment doors start to close until car has stopped level at next floor landing and doors are opening.

### 3.08 ADJUSTING

- A. Adjust for smooth acceleration and deceleration of car to minimize passenger discomfort.
- B. Adjust with automatic floor leveling feature at each floor landing to reach 1/4 inch maximum from flush with sill.
- C. Adjust all equipment to operate to within accepted design tolerances.
- D. Adjust all leveling devices so car stops within plus or minus 1/4" of finished floor.
- E. Lubricate all equipment in accordance with accepted manufacturer's instructions.
- F. Painting
  - 1. Paint all exposed metal work, furnished for installation, except wearing surfaces, with high grade rust preventative paint.
  - 2. Touch up factory applied paint surfaces as required

### 3.09 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove protective coverings from finished surfaces.

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HYDRAULIC ELEVATORS

- C. Keep work areas orderly and free of debris on a daily basis.
- D. Remove filings and loose materials resulting from this work from hoistways.
- E. Clean all dirt, oil and grease from machine room and pit equipment and floors.
- F. Clean car, car enclosures, entrances, hoistways, operating and signal fixtures and trim of dirt, oil, grease, and finger marks.
- G. Clean surfaces and components in accordance with manufacturers written instructions.
  1. Remove from hoistway surfaces all loose materials and filing resulting from this work.
  2. Clean machine room floor of dirt, oil and grease.
  3. Remove crating and packing materials from premises.

### 3.10 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals for additional submittals.
- B. See Section 01 7900 - Demonstration and Training for additional requirements.
- C. Demonstrate proper operation of equipment to Owner's designated representative.
- D. Demonstration: Demonstrate operation of system to Owner's personnel.
  1. Use operation and maintenance data as reference during demonstration.
  2. Conduct walking tour of project.
  3. Briefly describe function, operation, cleaning and maintenance of each component.
- E. Training: Train Owner's personnel on cleaning and operation and maintenance of system.
  1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
  2. Provide minimum of two hours of training.
  3. Instructor: Manufacturer's training personnel.
  4. Location: At project site, unless noted otherwise.

### 3.11 PROTECTION

- A. Do not permit construction traffic within car after cleaning.
- B. Protect installed products until Date of Substantial Completion.
- C. Touch-up, repair, or replace damaged products and materials prior to Date of Substantial Completion.

### 3.12 PERFORMANCE GUARANTEE

- A. The elevator contractor shall assume full responsibility to furnish and provide a complete and functional elevator and to obtain and furnish the final State Elevator Inspection approval.

### 3.13 ACCEPTANCE DEMONSTRATION and PERFORMANCE TEST

- A. Demonstrate to Owner, or Owner's designated representative, the operation of the elevator system. Demonstration shall include:

3.14 MAINTENANCE

- A. Refer to Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Provide Initial Maintenance Contract of elevator system and components in accordance with ASME A17.1 and requirements as indicated for 3 months from Date of Substantial Completion.
  - 1. Provide three (3) months full contract service beginning at the date of Final Acceptance of each elevator. Service to be provided on a monthly basis during regular working hours of regular working days except that emergency minor adjustment callback service shall be available 24 hours a day, 7 days a week.
- C. Submit proposal for continuation of Maintenance Contract in accordance with ASME A17.1 and requirements as indicated for installed elevator equipment.
- D. Perform maintenance contract services using competent and qualified personnel under the supervision and direct employ of the elevator manufacturer or original installer.
- E. Maintenance contract services shall not be assigned or transferred to any agent or other entity without prior written consent of Owner.
- F. Examine system components periodically.
- G. Include systematic examination, adjustment, and lubrication of elevator equipment.
- H. Maintain and repair or replace parts, whenever required, using parts produced by original equipment manufacturer.
- I. Perform work without removing cars from use during peak traffic periods.
- J. Provide emergency call back service during regular working hours throughout period of this maintenance contract.
- K. Maintain an adequate stock of parts for replacement or emergency purposes, and have personnel available to ensure the fulfillment of this maintenance contract without unreasonable loss of time.

END OF SECTION 14 2400

## SECTION 14 4200 WHEELCHAIR LIFTS

### PART 1 GENERAL

#### 1.01 SECTION INCLUDES

- A. Vertical platform wheelchair lifts.
  - 1. Fixed unit at front entry steps as indicated on drawings; less than 40" rise.
  - 2. Portable unit at upper level stage as indicated on drawings; less than 40" rise.
  - 3. Vertical permanently-installed wheelchair lifts. (Virtuoso 5460F) (Protege 5442F)
  - 4. Vertical portable wheelchair lifts. (Virtuoso 5460P) (Protege 5442P)
- B. Maintenance contract.

#### 1.02 RELATED REQUIREMENTS

- A. Division 26 for electrical connections.
- B. Section 26 0583 - Wiring Connections.
- C. Section 26 2726 - Wiring Devices.

#### 1.03 REGULATORY REQUIREMENTS

- A. Provide platform lifts in compliance with:
  - 1. ASME A18.1 - Safety Standard for Platform Lifts and Stairway Chairlifts.
  - 2. ASME A17.1 - Safety Code for Elevators and Escalators.
  - 3. ASME A17.5 - Elevator and Escalator Electrical Equipment.
  - 4. NFPA 70 - National Electric Code.
  - 5. ADA Accessibility Guidelines for Buildings and Facilities (ADAAG).
  - 6. ASME A17.5 - Elevator and Escalator Electrical Equipment.
  - 7. ASME A18.1 - Safety Standard for Platform Lifts and Stairway Chairlifts.
  - 8. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
  - 9. NFPA 70 (NEC) - National Electrical Code.

#### 1.04 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- B. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- C. ASME A17.1 - Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters with Automatic Transfer Devices 2019, with Errata (2021).
- D. ASME A18.1 - Safety Standard for Platform Lifts and Stairway Chairlifts 2020.
- E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021a.

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WHEELCHAIR LIFTS

- G. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel 2021, with Editorial Revision.
- H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2022.
- I. ASTM A786/A786M - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates 2015 (Reapproved 2021).
- J. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength 2020.
- K. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).
- L. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel 2018, with Errata (2022).
- M. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- N. ITS (DIR) - Directory of Listed Products Current Edition.
- O. NEMA MG 1 - Motors and Generators 2021.
- P. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- Q. UL (DIR) - Online Certifications Directory Current Edition.

#### 1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate installation of wheelchair lift system with adjacent construction using necessary attachments; provide anchoring devices in accordance with manufacturer's installation instructions; coordinate installation of cast-in-place concrete components.
  - 1. Electrical System: Coordinate utility and electrical system connections to ensure they are made in an orderly and expeditious manner.

#### 1.06 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Include data on material descriptions, construction details, component dimensions and profiles, and finishes; include data on rated capacities, electrical and operating characteristics, and necessary accessories.
- C. Shop Drawings: Include plans, elevations, sections, and attachment details; include equipment assembly details with dimensions, weights, loads, required clearances, components, size and location of anchors and required field connections, and methods for field assembly; provide diagrams indicating signal, power, and control wiring.
- D. Designer's qualification statement.
- E. Manufacturer's qualification statement.
- F. Installer's qualification statement.
- G. Testing agency's qualification statement.
- H. Maintenance contracts.

KINGSESSING RECREATION CENTER BUILDING AND SITE IMPROVEMENTS - PACKAGE #2

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WHEELCHAIR LIFTS



- I. Executed warranty.
- J. Project Record Documents: Accurately record actual locations of concealed items, conduits, and components.

#### 1.07 QUALITY ASSURANCE

- A. Designer Qualifications: Provide wheelchair lift design under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of type specified and with at least five years of documented experience.
- D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of type specified in this section.
- E. Documents at Project Site: Maintain at project site one copy of manufacturer's installation instructions, erection drawings, shop drawings, and reference standard documents.

#### 1.08 FIELD CONDITIONS

- A. Use of wheelchair lifts during construction for hoisting materials or personnel is not permitted.

#### 1.09 WARRANTY

- A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide 2-year manufacturer warranty to repair or replace wheelchair lift system components that fail in materials or workmanship. Complete forms in Owner's name and register with manufacturer.
- C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

### PART 2 PRODUCTS

#### 2.01 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME A18.1, ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).
- B. Accessibility Requirements: Comply with ADA Standards and ICC A117.1.
- C. Structural Performance: Comply with ASCE 7 for loading of wheelchair lift components and assemblies.
- D. Perform welding of steel in accordance with AWS D1.1/D1.1M.
- E. Perform electrical work in accordance with NFPA 70.

## 2.02 VERTICAL PLATFORM WHEELCHAIR LIFTS

### A. Manufacturers:

1. Basis of Design for fixed unit at entry steps: Ascension Wheelchair Lift; [www.ascension-lift.com](http://www.ascension-lift.com)
  - a. Manufacturer: Ascension®, a division of AGM Container Controls, Inc., which is located at: 3526 E. Ft. Lowell Rd.; Tucson, AZ 85716; Toll Free Tel: 800-459-0400; Tel: 520-881-3993; Fax: 520-881-4983; Email: [request info](mailto:requestinfo@ascension-lift.com) ([WebSales@ascension-lift.com](mailto:WebSales@ascension-lift.com)); Web: <https://ascension-lift.com>
  - b. Model: (Virtuoso 5460F)
2. Subject to compliance with requirements and approval of appearance, size, compatibility and performance by the following:
3. Butler Mobility Products; \_\_\_\_\_: [www.butlermobility.com/#sle](http://www.butlermobility.com/#sle).
4. Garaventa Lift; Genesis Enclosure - Vertical Platform Lift: [www.garaventalift.com/#sle](http://www.garaventalift.com/#sle).
5. Garaventa Lift; Genesis Opal - Unenclosed Vertical Platform Lift: [www.garaventalift.com/#sle](http://www.garaventalift.com/#sle).
6. Garaventa Lift; Genesis Shaftway - Vertical Platform Lift: [www.garaventalift.com/#sle](http://www.garaventalift.com/#sle).
7. Savaria; \_\_\_\_\_: [www.savaria.com/#sle](http://www.savaria.com/#sle).
8. Vertical Platform Lifts; \_\_\_\_\_: [www.vertical-platform-lifts.com/#sle](http://www.vertical-platform-lifts.com/#sle).

### B. No. 1, Vertical Platform Wheelchair Lifts: Provide manufacturer's standard type that complies with indicated requirements. Use manufacturer's standard components for vertical platform wheelchair lifts as required for complete system unless otherwise indicated.

1. Type of Vertical Platform Wheelchair Lift:
2. Configuration:
3. Location:
4. Lift Load Capacity: \_\_\_ lb, maximum.
5. Lifting Height from Bottom to Upper Floor Level: As indicated on drawings.
6. Platform Width Clearance: \_\_\_ inches.
7. Platform Length Clearance: \_\_\_ inches.
8. Platform Side Wall Panels: Nominal height of 42 inches, with galvanized steel sheet panels, and enclosed within rectangular extruded aluminum framework.
9. Platform Floor: Steel sheet with matte finish, having overall thickness not greater than 1-1/2 inches.
10. Drive System:
11. Drive System Enclosure: Provide rectangular galvanized steel tube frame with flush steel sheet panels on sides and top to enclose drive system components; securely attach enclosure to adjacent substrate.

### C. VERTICAL PERMANENTLY-INSTALLED WHEELCHAIR LIFTS (Virtuoso 5460F)

1. Lift Product: Virtuoso 5460F as manufactured by Ascension. Unenclosed, self-contained vertical wheelchair lift for use by individuals with disabilities. Raises and lowers platform and occupant providing accessibility to stages, platforms, or similar elevated surfaces.
  - a. Low Profile: No machine tower, to maintain viewing lines.
  - b. Platform: Supported by an electro-hydraulic lifting mechanism.
  - c. Independent Use: By individuals with disabilities.
  - d. ADA Compliant: Includes applicable operating and safety devices.
  - e. Platform Floor: Low-profile facilitating entry to the lift. Eliminates need for an installation pit or an access ramp at lower landing end.
2. Physical Characteristics:
  - a. Lifting capacity: 750 lbs (340 kg).
  - b. Weight of Lift: 1025 lbs (465 kg) maximum.
  - c. Vertical Speed: 7 ft per min (2.1 mpm).

- d. Vertical Travel: 12 to 60 inches (305 to 1524 mm), infinitely adjustable.
- 3. Gate Configuration:
  - a. Lower Gate:
    - 1) Manual Operation: Left handed. Self-closing.
    - 2) Manual Operation: Right handed. Self-closing.
    - 3) Automatic Operation: Left handed.
    - 4) Automatic Operation: Right handed.
  - b. Upper Gate:
    - 1) Manual Operation: Left handed. Self-closing.
    - 2) Manual Operation: Right handed. Self-closing.
    - 3) Automatic Operation: Left handed.
    - 4) Automatic Operation: Right handed.
- 4. Dimensions:
  - a. No part of the lift to be over 44 inches (1117 mm) high when platform is on the ground except when equipped with optional stage guard.
  - b. Required Clear Space (WxL): 51.25 x 64.25 inches (1302 x 1632 mm).
  - c. Lift Dimensions (WxLxH): 47.25 x 62.75 x 44 inches (1200 x 1594 x 1118 mm).
  - d. Platform Clear Space: 36 x 54 inches (914 x 1372 mm).
    - 1) Sidewalls and Platform Gates: 43 inches (1092 mm) high
- 5. Materials:
  - a. Platform, Base Frame, and Lifting Device: ASTM A 36 or similar low-carbon steel.
  - b. Windows: 1/4 inch (6 mm) thick high impact strength clear thermoplastic.
  - c. Safety Skirt: Constructed from rigid plastic.
- 6. Finish:
  - a. Exposed Metal Surfaces: Finished by powder coating.
  - b. Color to be selected by architect
- 7. Drive Configuration: Direct-acting hydraulic.
  - a. Synchronized Hydraulic Cylinders: Evenly support both sides of lift platform.
  - b. Hydraulic Power Unit: Mounted on vibration-isolating supports minimizing vibration transmission and reducing frame-borne noise.
- 8. Electrical Requirements:
  - a. Amperage Draw per Lift: 13 Amps maximum.
  - b. Service: 120 VAC, 60 hertz, single phase, 15 amp service. Three prong grounded electrical cord. Length: 20 feet (6.1 m).
  - c. Motor: 1/2 hp, 115 V AC single phase.
  - d. Electrical System: Certified to ASME A17.5 by independent testing laboratory.
- 9. Lift Safety Devices:
  - a. Lift Construction: Meet applicable requirements of ASME A18.1, ASME A17.5, ADAAG, ANSI 117.1, and NFPA 70 (NEC).
  - b. Included Safety Features: For passenger and general public protection.
    - 1) Safety Skirt: Completely encloses and protects area under platform.
      - a) Switches: Stop platform movement in case of excess skirt deflection.
    - 2) Operating Switches: Constant pressure.
    - 3) Emergency Stop Button: Lighted, sounds audible alarm.
    - 4) Electro-Mechanical Interlock: Prevents accidental opening of lower platform gate, and if provided, the upper landing gate.
    - 5) Gate Switches: Prevent operation if either platform gate is open.
    - 6) Hand Pump: Allows platform to manually be raised or lowered.
    - 7) Sidewalls and Platform Gates: 43 inches (1092 mm) high.
      - a) Visibility: Unobstructed view. Transparent sidewalls and platform gates.
    - 8) Lift platform stop height sensor.
    - 9) Platform Floor: Low profile and slip resistant surface.

- 10) No installation pit or external access ramp at the lower landing.
- 10. Compression Capability: May be compressed to 33 inches (838 mm) wide facilitating relocation through a 36 inches (914 mm) wide doorway.
  - a. Compression Tool Kit: Recommended to facilitate compression of the lift. From Ascension.
- 11. Add-Ons to be approved; see drawings:
  - a. Upper Landing Gate: Stationary gate mounted at the upper landing that guards against falling onto the lift from the upper landing. For applications that require guard rails be installed at the upper landing.
    - 1) Operation and Handling: as specified in the "Gate Configuration" Paragraph in this Article.
  - b. Automatic Standby Power (Battery Backup): Minimum 5 lift cycles at full load during power outage events.
  - c. Two-Way Communication: Hands-free autodialing phone on platform.
  - d. Universal Keys: Limits lift use to authorized persons.

## 2.03 VERTICAL PLATFORM WHEELCHAIR LIFTS (PORTABLE)

- A. Manufacturers:
  - 1. Basis of Design for Portable Stage Lift: Ascension Wheelchair Lift; [www.ascension-lift.com](http://www.ascension-lift.com)
    - a. Model: (Virtuoso 5460P)
  - 2. Subject to compliance with requirements and approval of appearance, size, compatibility and performance by the following:
  - 3. Product by the same manufacturer as the fix lift at entry steps.
- B. Requirements are similar to fixed unit UNO:
- C. Provide plug-in rechargeable battery operations; when stored the unit can be plugged in to recharge on board battery.
- D. Provide direct power plug cord option.
- E. VERTICAL PORTABLE WHEELCHAIR LIFTS (Virtuoso 5460P)
  - 1. Lift Product: Virtuoso 5460P as manufactured by Ascension. Portable lifting device, unenclosed and self-contained, requiring no additional components or facility modifications. Raises and lowers platform and occupant providing accessibility to stages, platforms, or similar elevated surfaces.
    - a. Low Profile: No machine tower to maintain viewing lines.
    - b. Platform: Supported on an electro-hydraulic lifting mechanism with built-in casters for portability.
    - c. Casters: Permit easy movement of unoccupied lift over hard, level surfaces.
      - 1) With Casters Removed: Lift to rest firmly on any hard, level surface, providing a stable base for operation of lift.
    - d. Independent Use: By individuals with disabilities
    - e. ADA Compliant: Includes applicable operating and safety devices.
    - f. Platform Profile: Low profile facilitating entry to the lift. Eliminates need for a pit or access ramp at lower landing.
  - 2. Physical Characteristics:
    - a. Lifting Capacity: 750 pounds (340 kg).
    - b. Weight of Lift: 1025 pounds (465 kg) maximum.
    - c. Vertical Speed: 7 fpm (2.1 mpm).
    - d. Vertical Travel: 12 to 60 inches (305 to 1524 mm), infinitely adjustable.
  - 3. Gate Configuration:

- a. Lower Platform Gate:
  - 1) Manual Operation: Left handed. Self-closing.
- b. Upper Platform Gate:
  - 1) Manual Operation: Right handed. Self-closing.
- 4. Dimensions:
  - a. No part of the lift to be over 44 inches (1117 mm) high when platform is on the ground except when equipped with optional stage guard.
  - b. Space Requirements; Operational, Storage, and Transport (HxLxW): 44 x 66 x 48 inches (1117 x 1677 x 1219 mm). Height is for platform in the down position.
  - c. Platform Clear Space: 36 x 54 inches (914 x 1372 mm).
    - 1) Sidewalls and Platform Gates: 43 inches (1092 mm) high
- 5. Materials:
  - a. Platform, Base Frame, and Lifting Device: ASTM A 36 or similar low-carbon steel.
  - b. Windows: 1/4 inch (6 mm) thick high impact strength clear thermoplastic.
  - c. Safety Skirt: Constructed from rigid plastic.
- 6. Finish:
  - a. Exposed Metal Surfaces: Finished by powder coating.
  - b. Color as selected by architect
- 7. Drive Configuration: Direct-acting hydraulic.
  - a. Synchronized Hydraulic Cylinders: Evenly support both sides of lift platform.
  - b. Hydraulic Power Unit: Mounted on vibration-isolating supports minimizing vibration transmission and reducing frame-borne noise.
- 8. Electrical Requirements:
  - a. Amperage Draw per Lift: 13 Amps maximum.
  - b. Service: 120 VAC, 60 hertz, single phase, 15 amp service. Three prong grounded electrical cord. Length: 20 feet (6.1 m).
  - c. A Ground Fault Circuit Interrupter (GFCI).
  - d. Motor: 1/2 hp, 115 V AC single phase.
  - e. Electrical System: Certified to ASME A17.5 by independent testing laboratory.
- 9. Lift Safety Devices:
  - a. Lift Construction: Meet applicable requirements of ASME A18.1, ASME A17.5, ADAAG, ANSI 117.1, and NFPA 70 (NEC).
  - b. Included Safety Features: For passenger and general public protection.
    - 1) Safety Skirt: Completely encloses and protects area under platform.
      - a) Switches: Stop platform movement in case of excess skirt deflection.
    - 2) Operating Switches: Constant pressure.
    - 3) Emergency Stop Button: Lighted, sounds audible alarm.
    - 4) Electro-Mechanical Interlock: Prevents accidental opening of lower platform gate, and if provided, the upper landing gate.
    - 5) Gate Switches: Prevent operation if either platform gate is open.
    - 6) Hand Pump: Allows platform to manually be raised or lowered.
    - 7) Sidewalls and Platform Gates: 43 inches (1092 mm) high.
      - a) Visibility: Unobstructed view. Transparent sidewalls and platform gates.
    - 8) Lift platform stop height sensor.
    - 9) Platform Floor: Low profile and slip resistant surface.
    - 10) No installation pit or external access ramp at the lower landing.
- 10. Portability:
  - a. Casters: 3-1/2 inches (89 mm) diameter hard rubber. Attachable to platform without tools; stored in base frame when not in use.
  - b. Once attached, lift rolls easily over hard, smooth, level surfaces.
  - c. Lift may be moved via fork lift or fork truck.
- 11. Operating Characteristics:

- a. Three Constant Pressure "UP/DOWN" Switches
  - b. Platform Stop Height: Adjustable without use of tools.
  - c. Opening Upper Landing Platform Gate: Deploys a dock plate that rests on the upper landing surface.
    - 1) Dock Plate: Provides smooth transition between platform and upper landing. Closing upper landing platform gate retracts the dock plate.
12. Compression Capability: May be compressed to 33 inches (838 mm) wide facilitating relocation through a 36 inches (914 mm) wide doorway.
- a. Compression Tool Kit: Recommended to facilitate compression of the lift. From Ascension.

#### 2.04 ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Electrical Characteristics:
  - 1. System wiring connections; see Section 26 0583.
  - 2. System wiring devices; see Section 26 2726.
- B. Platform Controls: Continuous pressure switch, one for each direction, with keyless operation.
- C. Geared Motor: Comply with NEMA MG 1.
- D. Motor Control: Inverter control and other components as required by manufacturer for system indicated.
- E. Disconnect Switch: Factory mount disconnect switch in control panel.
- F. Emergency Operation: Provide manual operation, battery-powered system, connection to standby electrical power, and \_\_\_\_\_ to raise or lower lift to landing due to malfunction or loss of power.
- G. Electrical Components, Boxes, Conduit, Wiring, and Devices: Comply with NFPA 70 and UL (DIR) or ITS (DIR) listed and labeled, and marked as applicable for proposed locations.

#### 2.05 MATERIALS

- A. Rolled Steel Sections, Shapes, and Rods: Comply with ASTM A36/A36M.
- B. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Designation SS (structural steel), Grade 33 (230), with G90/Z275 coating.
- C. Rolled Steel Floor Plates: Comply with ASTM A786/A786M, 1/8 inch thick, with manufacturer's standard surface pattern; rolled from steel plate complying with ASTM A572/A572M, Grade 55 (380).
- D. Steel Tubing: Comply with ASTM A500/A500M, cold formed.
- E. Anchor Bolts and Rods: Comply with ASTM F1554, Grade 55.
- F. Welding: Comply with applicable requirements of AWS D1.1/D1.1M and AWS D1.3/D1.3M.

#### 2.06 EQUIPMENT

- A. Lubrication of Equipment: Provide grease fittings for lubricating bearings requiring periodic lubrication, automatic feed type grease cups, and visible and easily accessible lubrication points.

- B. Guide Rails, Ropes, Counterweights, Sheaves, Attachment Brackets, and Anchors: Sized in accordance with local building code, including safety factors.
- C. Maintenance Devices: Provide as necessary within wheelchair lift system, supported on structural members within accessible locations.

## 2.07 FINISHES

- A. Baked-On Factory Finish for Structural Metal Surfaces: Clean surfaces of rust, oil, or grease and wipe clean with solvent; apply manufacturer's standard two-coat, baked-on finish consisting of primer and thermosetting top coat.
  - 1. Color: Manufacturer's standard color range to be selected by architect.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that areas and conditions comply with installation tolerances and other conditions affecting this work.
- B. Verify that locations for electrical rough-in connections to system equipment are in acceptable locations before installing equipment.
- C. Verify that electrical power is available and of correct characteristics.
- D. Verify that walls, stairways and floors for wheelchair lift areas are plumb and square, and properly sloped for drainage.
- E. Do not proceed with installation until unacceptable conditions have been corrected.

### 3.02 PREPARATION

- A. Prepare surfaces of substrates using methods in accordance with lift manufacturer's installation instructions.
- B. Clean surfaces thoroughly before starting installation of lifts.

### 3.03 INSTALLATION

- A. Install wheelchair lift system and components in accordance with manufacturer's written installation instructions.
- B. Install wheelchair lift system securely to supporting structure, and flush with adjacent surfaces.
- C. Install structural components using methods that comply with requirements indicated relative to layout and structural position.

### 3.04 ADJUSTING

- A. Adjust wheelchair lift equipment to operate smoothly and safely.
- B. Verify vertical travel of wheelchair lift system; adjust as necessary to maintain operating range indicated.

- C. After installation, inspect exposed factory-finished wheelchair lift equipment and repair damaged finishes.

### 3.05 FIELD QUALITY CONTROL

- A. Perform acceptance tests as required by code and the authority having jurisdiction. Place rated load on platform and operate for several cycles to verify correct installation and operation. No mechanical failures shall occur and no wear that would affect the reliability of the lift shall be detected.

### 3.06 CLEANING

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Remove protective coverings from finished surfaces.
- C. Clean surfaces and components.

### 3.07 CLOSEOUT ACTIVITIES

- A. See Section 01 7800 - Closeout Submittals for closeout submittals.
- B. See Section 01 7900 - Demonstration and Training for additional requirements.
- C. Demonstrate proper operation of wheelchair lifts to Owner's designated representative.
- D. Training: Train Owner's personnel on operation and maintenance of system.
  - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
  - 2. Provide minimum of two hours of training.
  - 3. Instructor: Manufacturer's training personnel.
  - 4. Location: At project site.

### 3.08 MAINTENANCE

- A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.
- B. Provide a separate maintenance contract for specified maintenance service.
- C. Perform maintenance work using competent personnel under supervision and in direct employment of wheelchair lift installer.
- D. Assigning or transfer of maintenance service to any agent or subcontractor is not permitted without prior consent of Owner.
- E. Examine monthly; clean, adjust, and lubricate equipment.
- F. Repair, or replace parts when required with parts produced by original equipment manufacturer.
- G. Provide emergency call back service 24 hours per day during maintenance period.

END OF SECTION 14 4200